

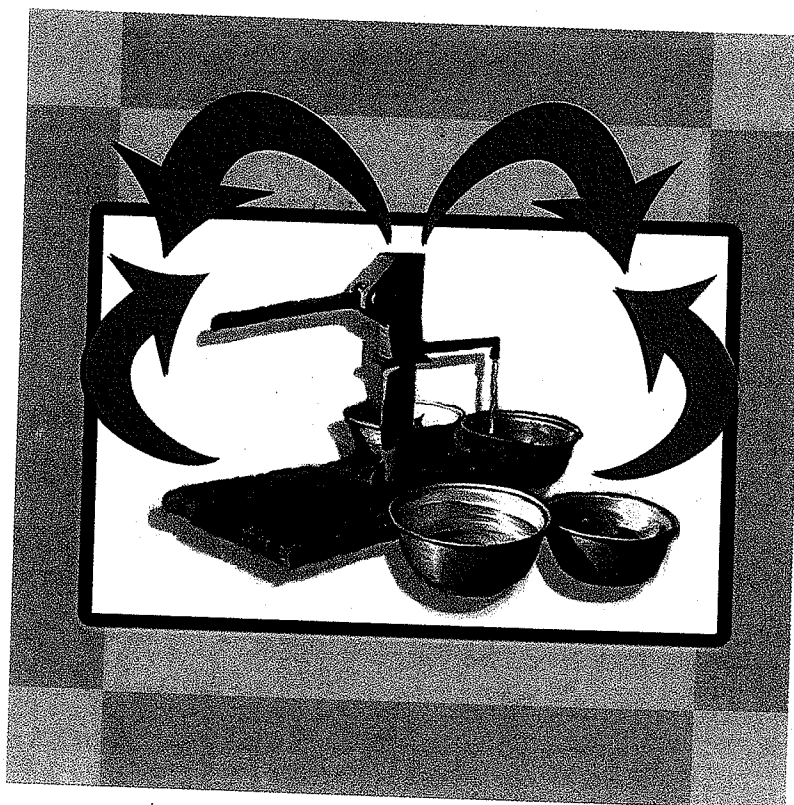
Master's thesis

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The institutional reality of common pool resources

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<i>Preface</i>	<i>iv</i>
1. INTRODUCTION	1
2. METHODOLOGY	3
2.1 Hard facts	3
2.2 Methodological issues, problems and dilemmas	4
2.2.1 Choosing respondents	4
2.2.2 Semi-structured interviews	4
2.2.3 The use of interpreters	6
2.2.4 Researcher effects	9
2.2.5 Anonymisation	11
2.2.6 Analysis of data	13
3. THEORY	15
3.1 Social institutions	15
3.2 Rules and incentives	18
3.2.1 Different types of rules	18
3.2.2 AD/CO	19
3.2.3 Three pillars of institutions	21
3.2.4 Incentives	23
3.3 Common pool resources, social dilemmas and collective action	24
3.3.1 Common pool resources	24
3.3.2 Social dilemmas created by the characteristics of common pool resources	25
3.3.3 Theoretical solutions to the social dilemma	28
3.4 Common pool resources of water and potential solutions to the social dilemma	29
3.4.1 Ostroms design principles for long-enduring common pool resource institutions	30
3.4.2 The role of heterogeneity on common pool resource institutions	32
3.5 Can institutions be designed?	34

4. ANALYSIS	38
4.1 An institutional analysis of two cases – a borehole and an irrigation system	38
4.2 The borehole	38
4.2.1 Context and history	39
4.2.2 Institutional history	41
4.2.3 A clash of institutions – traditional institutions “beat” modern institutions	45
4.2.4 The resource today – “ownership”	46
4.2.5 The resource today – use, regulations and violations	47
4.2.6 The appropriators	52
4.2.7 Summary	54
4.3 The irrigation scheme	55
4.3.1 History and context	55
4.3.2 Three is a crowd	59
4.3.3A story of institutional collapse in one season	61
4.3.4 Farming with an engine for the first (and last?) time	65
4.3.5 The grim prospects of a new season	67
4.3.6 Summary	68
5. PUBLIC GOODS GAMES	69
5.1 Playing games	69
5.2 Game theory and sociology	69
5.3 Games as a third, experimental case	71
5.4 Questions for the games	72
5.5 Playing Games – practicalities	73
5.6 The first series: “true villagers” play public goods game	76
5.7 The second series: “traders” play public goods game	79
5.8 The third series: “true villagers” play public goods games with “traders”	82
5.9 Concluding remarks: learning from public goods games?	85
6. CONCLUDING REMARKS	89
 LITTERATURE CITED	 94
 APPENDIX	 a

LIST OF FIGURES AND TABLE

FIGURE 1:	Malawi with the central region of Kasungu Highlighted	3
FIGURE 2:	The process of doing qualitative interviews with interpreters	8
FIGURE 3:	The components of the ADICO-syntax in a stylised example	20
FIGURE 4:	Institutional and organisational framework for an irrigation system as designed by the Catholic Development Commission of Malawi	58
FIGURE 5:	Placement of players and researchers route in the classroom during public goods games	75
FIGURE 6:	Group investment and payoff in group 1	76
FIGURE 7:	Group investment and payoff in group 2	77
FIGURE 8:	Group investment and payoff in group 3	78
FIGURE 9:	Group investment and payoff in group 4	79
FIGURE 10:	Group investment and payoff in group 5	80
FIGURE 11:	Group investment and payoff in group 6	81
FIGURE 12:	Group investment and payoff in group 7	81
FIGURE 13:	Group investment and payoff in group 8	82
FIGURE 14:	Investment as a group, average investment for <i>traders</i> and average investments for <i>true villagers</i> in group 9	83
FIGURE 15:	Group investment and payoff in group 10	85
FIGURE 16:	Group investment and payoff in group 11	85
FIGURE 17:	Group investment and payoff in group 12	86
TABLE 1:	Different uses of water and its regulations	52

PREFACE

Through participation in the Malawi Land Tenure and Social Capital Research Project (MLT&SC) I have been able to travel to Malawi and study the interplay between social and physical reality in a context that would otherwise have been un-accessible to me. For this I am grateful. Several people in the project deserve explicit thanks. First, my tutor Erling Berge for his help at all stages of the process. In planning for the fieldwork, making life in Malawi comfortable and in writing the thesis his experience and knowledge has been invaluable. Also thanks to Dr. Stanley Khaila at Bunda College for many interesting discussions and much appreciated logistic help on many occasions during our stay in Malawi. Thanks to Henrik Wiig, Alister Muthali and Daimon Kambewa; it's been a pleasure getting to know you all!

Also, of course, thanks to Sverre Bjørnstad – travel mate and fellow student providing Norwegian conversation in Malawi. Thanks to Marie Ervik Smette and Ragnhild Haugli Bråthen; hope you guys are doing ok! I thank our trusted interpreters; Alan Dyless and White Mwambo for their job as translators, but also for great company in general. Thanks to William Chimombo for his work as translator early in the process. Another thank you goes to Alinafe Chibwana for challenging input and local know-how. Thanks to Samu Samu at Bunda College for introducing us to Malawi through his excellent course.

I would also like to express sincere gratitude to the family (sadly I cannot name you here) who allowed us to stay with them for almost three months in Malawi, and to the many respondents who gladly allowed us to “steal” several hours of their time without prior warning. Thanks to the District Commissioner of Kasungu, and to the Chief, Group village Headmen, and Village Headmen in the area where we did our research for allowing us access and tolerating our questioning. Thanks to the local school headmaster and teachers for kindly allowing us to use your schoolhouse. It is not without reason that Malawi is known as *the warm heart of Africa*! Thanks to Aksel Tjora at NTNU for comments on methodology.

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Tomas Moe Skjølsvold, 01.05.2008

1. INTRODUCTION

Survival can be difficult in rural Malawi. Some point to HIV/AIDS as the country's greatest foe, while others emphasise the threat of famine. Land scarcity, political unrest and poor infrastructure are also worthy contenders¹. This paper deals with a resource that has the potential of saving lives if managed properly, but can create new difficulties and foster conflict if miss-managed. This paper will focus on *water* and the ways this resource is managed in rural Malawi.

The importance of water is unarguable. Cocklin (2002) identifies four reasons why water-issues are of the major global challenges facing humanity. *First* is widespread scarcity of supply. *Second* is its essentiality to human survival. *Third* is its economic value, and *fourth* is the strategic and military importance of many water sources. Adding thrust to waters importance, Saleh and Dinar (2004) sees us as approaching a global water crisis; a crisis that require attention from both scholars and politicians. Different scholars, they add, should focus on four different *dimensions* of the crisis. These are the physical-, the economic-, the policy-, and last but not least the *institutional dimension* (Saleh and Dinar, 2004)².

This thesis then, deals with water. Not water *as such*, but the way humans organise and regulate their access to and use of it. Thus my focus is what Saleh and Dinar (2004) label the *institutional* dimension of water management. I will illustrate how vital water is to people living under difficult conditions and it will become obvious that water management deeply affects the life of people in rural Malawi.

More specifically the thesis is a case study of two water management systems, both located in the central region of Malawi. One is a borehole providing clean drinking water to several villages, the other an irrigation scheme watering previously dry and un-cultivated land. Waters importance, however, serves as no success-guarantee for social and physical structures

¹ Estimates from 2003 say 14 percent of the adult population aged 15-49 living outside urban centres are infected with HIV/AIDS (Watkins, 2004). The country last faced famine in 2002 when it experienced its worst case since 1949 (Devereux, 2002). Doward and Kydd (2004) asses challenges for rural development in Malawi and highlight a: "...narrow range of risky and low productivity activities(...)exacerbated by poor infrastructure, services and communications(...)low(...)education and literacy(...)and poor health exacerbated by the spread of HIV/AIDS" (Dorward & Kydd 2004, 346)

² The water crisis has two major dimensions overarching these four. First is a quantitative dimension tied to resource- scarcity. Second a qualitative dimension referring to pollution and degradation of water-sources that was previously suitable for consumption (Saleh and Dinar 2004).

constructed around the resource. One of the cases studied, the irrigation scheme, has experienced collapse of both social system and physical structures. The borehole is performing better, but faces severe challenges that need to be overcome if it is not to suffer the same fate. Trying to explain why the two systems have achieved different levels of success and why both perform relatively poor will be one of the goals of this paper.

Theoretically both cases can be described as *common pool resources*. Both were in part initiated by external agents of aid who implemented their own sets of rules and ideas on how the communities should manage the resources. Looking at the cases as common pool resources opens the door to a vast literature with a tradition of linking physical resources and structures to social institutions. In this thesis I want to capture the essence of the social institutions influencing how these particular common pool resources are governed. My hope is that visualising the institutions will allow us to understand, at least to some degree, why the systems are failing at their task. Hence my question of research is as follows: "*How can social institutions help explain the different level of success for two common pool resource governance regimes in the central region of Malawi?*"

In the quest for potential answers several research-methods are applied. The thesis is mainly a qualitative account with the majority of data gathered through in-depth interviews with people tied to the cases of study. Additionally it contains an experimental element grounded in the game-theoretical tradition. Through a series of *public goods games* structured to resemble the cases of study I hope to shed a different light on the way people of this area cooperate or fail at this on a common endeavour.

The thesis is structured as follows. Chapter two reviews the research-methods applied. Particular attention is given to processes that may have influenced the data. Chapter three looks at the theoretical assumptions of the thesis. I examine institutional theory in general and look in detail at how scholars anchored in this tradition has handled issues similar to the ones studied here. In chapter four the data tied to the two cases is analysed. I attempt to show how social institutions can be seen as affecting how the two common pool resources are governed. Chapter five raises the topic of experimental games. The theme is discussed both theoretically and methodologically before I examine and analyse the results from the games conducted in Malawi. Chapter 6 contains concluding remarks.

2. METHODOLOGY

Lyenda (2007) argues methods of field-research and data collection in most of Africa differ greatly from what can be done in the west. Thus it poses many challenges for sociologists doing fieldwork. This chapter reviews the research-process and methods utilised to collect data for the thesis. Since the most important tool for gathering data was the *interview* this method is scrutinised with extra care³.

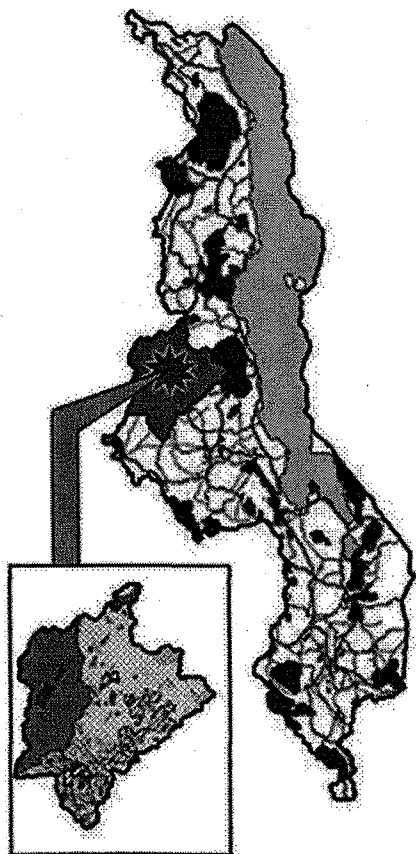


Fig 1: Malawi with the central region of Kasungu highlighted. (Based on map in Kasungu District Executive Committee 2006)

2.1 Hard facts

The data was collected in the summer of 2007, more precisely June 15th - August 10th. Both cases of study are located in Malawi's central region in the administrative district of Kasungu⁴. Figure 1 shows Malawi with Kasungu highlighted. Most data was obtained through a series of 40 in-depth interviews with users, participants, funders and leaders of either (a.) the borehole or (b.) the irrigation system. Some interviews of relevance to both cases were also carried out. Respondents in this category include local leaders at various levels. In addition to interviews, access was gained to written accounts like record-books, receipt-books, official records and reports from NGO's.

To strengthen and shed an alternative light on the interview-data and case-studies, a series of experimental *public goods games* with participants from the community were conducted. These provide additional data, allowing

us to see the results with a different set of spectacles, but is a challenge interpreting. Questionnaires and short post-game interviews add to the richness of data generated by the games. I will not go into details about them here, but refer you to chapter 5 for a

³ I often refer to *researchers* plurally; using terms like "we"/"us". Interviews were conducted in collaboration with Sverre Bjørnstad; fellow student and friend doing fieldwork in the same period in the same area.

⁴ The administrative region of Kasungu had 14 traditional authorities as of 2005 (Kasungu District Executive committee 2006). One of these holds jurisdiction over the area in which the fieldwork was carried out. For reasons to be discussed in chapter 2.2.5 the traditional authority will remain anonymous throughout this thesis. As of 2002 Malawi had 27 administrative districts in three regions. Under these approximately 250 Traditional Authorities existed (Benson et. al 2002).

comprehensive review of the public goods games in terms of theory, methodology, and analysis of results.

2.2 Methodological issues, problems and dilemmas

Social research is an endeavour filled with challenges. Sometimes they are mere practicalities; at other times they are deeper in implications, placing researchers in situations where choice require ethical assessment. Hoddinott and Pill (1997) claims a general problem in papers using qualitative methods is lack of explicit methodological detail. Being explicit, they add, is important for the critical appraisal of research where the research-context can influence data. I now explore the ways data for this thesis was collected. The goal is being as explicit as possible while maintaining a critical distance to my own work.

2.2.1 Choosing respondents for interviews

Without respondents there are no interviews. But does it matter who they are? From start the purpose of this study was to examine two cases - one borehole and one irrigation system, with focus on the social systems surrounding them. Thus including respondents from all layers of both organisations were seen as a minimum requirement⁵. In light of this a *purposive method of sampling* was adopted. Because its goal is finding cases providing rich data the process is guided by theory or hypotheses; either as starting points or as a knowledge-base growing progressively with research. The sample is flexible, evolving as the study develops, informed by analysis of data and developing understanding (MacDougall and Fudge 2001).

The description fits the experiences of this study. Knowledge of the two cases was limited when the project began. As fieldwork progressed knowledge expanded day-by-day as did the need to talk to new people. One of *many* examples was found doing interviews about the irrigation scheme. Early in the process we did not know the effort involved several villages. Learning this fact created the need to talk to a whole new subset of respondents.

2.2.2 Semi-structured interviews

Most people know what interviews are. Nevertheless they require methodological scrutiny. The *qualitative interview* as a way of collecting data is widely used in social science; positivist, interpretive and critical researchers all apply the method. It is used in case studies,

⁵ This means talking to leaders, members, appropriators, and people who had left the respective systems were vital from the start. Our knowledge of who belonged to these categories was, however, limited.

action research, grounded theory and ethnographies (Myers and Newman 2006). In short interviews are: "...the most common and one of the most important data gathering tools in qualitative research" (Myers and Newman 2006, 3). This study represents no exception. As noted the main source of data is a series of 40 in-depth interviews with respondents tied to the cases of study. One can describe interviews in qualitative research as:

"...encounters between a researcher and a respondent in which the latter is asked a series of questions relevant to the subject of research. The respondent's answers constitute the raw data analyzed at a later point in time by the researcher" (Ackroyd and Hughes 1983, 67).

For this study, however, descriptions of *encounters between researcher and respondent* need an additional element. Due to language-barriers interpreters was required for achieving verbal communication. This opens the door to a range of challenges which implications deserve discussion. I refer you to chapter 2.2.3 for a thorough review of the issue.

To boost quality and quantity of data a model of *semi-structured interviews* was applied. This includes having a set of core questions on the main topic asked in all interviews, while supplementing with different questions according to who is interviewed (Lyenda 2007)⁶. Further it allows for spontaneous questions to be asked (Lyenda 2007). Thus semi-structured interviews utilise *incomplete scripts* as opposed to structured interviews with complete scripts and minimal room for improvisation (Myers and Newman 2007). Based on these characteristics Guy et al. asserts their key advantage is allowing for: "*gaining of extensive information, verified by (...) discussion and probing in problem areas*" (Guy et al. 1987, 245).

Interviewing is not as easy as it may sound, and many things must be contemplated in the process. Myers and Newman (2007) review the literature and point to a range of issues in need of consideration. Several are relevant to this study and in what follows I address some of their concerns. Their first point can hardly be avoided; the *artificial nature of an interview*. Interviews are situations where strangers are interrogated, asked to give, or create opinions on themes under time-pressure (Myers and Newman 2007). Their second point follows consequently. Researchers must know that interview-situations are instances where *constructions* of knowledge or new realities are plausible outcomes. They claim naïve interviewers tend to see themselves as "sponges", merely soaking up data. In reality, however,

⁶ I refer you to appendix 1 for a list of core questions and themes in this study

interviewees can be reflecting on issues they have not given explicit attention earlier. In order to seem well-informed “new” stories of reality may be created (Myers and Newman 2007).

Both points are relevant to this study and conscious attempts were made to counter them. Prior to interviews efforts were made to assure respondents that our purpose was not to test knowledge, and that answering “*I don’t know*” should not be associated with shame⁷. In retrospect it appears our strategy worked fairly well as most interviews have instances of this response. To think that we eliminated the problem would, however, be naïve. Thus efforts to avoid being fooled needed to be made also when analysing data. Notes on body language and discussions with interpreters and other researchers were helpful means to this end.

Another feature of interview-situations deserving attention is duration. Since semi-structured interviews are fluid, planning the length of each interview is difficult. It seems, however, reasonable to assume that their length influences the *quality* of data. Short interviews mean diminutive data, while lengthy interviews may leave participants exhausted. In this study the interviews length varied from 40-50 minutes up to 2-3 hours. Most interviews were conducted outside respondent’s household, often on floor-mats. Sometimes the sun was boiling, other times wind carrying large quantities of dust was a problem. In retrospect I realise information gathered at the end of interviews going beyond 2 hours may have been of better quality if collected under other circumstances. Luckily only a few interviews reached these lengths. We kept focusing on time and efforts were made to keep it down. Based on experience from Sub-Saharan Africa, Lyenda (2007) claims 60-90 minutes to be an ideal length. Based on practice in this project I agree, and luckily most interviews were kept within this timeframe.

2.2.3 The use of interpreters

One challenge to qualitative interviews addressed by Myers and Newman (2007) yet to be considered is the *ambiguity of language*. They say:

“The meaning of words is often ambiguous, and it is not always clear that subjects fully understand the questions (...). Asking questions and getting answers is a much harder task than it may seem at first. The

⁷ The importance of this cannot be under-emphasised. Experienced researchers from Malawi warned us that appearing ignorant was associated with extreme humiliation. Elster see this as a general characteristic of human behaviour, particularly strong in some cultures: “*Even when people have no grounds for having any belief on a given topic, they often feel irresistibly compelled to form an opinion – not a specific opinion (...), but some opinion or other*” (Elster 2007, 126).

This problem is more explicit in this study since the researcher doesn't speak and understand the respondent's language. In order to achieve verbal communication we relied on interpreters fluent in English and Chichewa⁸. This has several potential implications. First it is a common assumption that different languages produce and express different realities (Kapborg and Bertrö 2002, 52). Similarly, language is often seen as a basic way for cultures to organise and structure both physical and social reality. Thus understanding another culture without being able to make sense of its language is impossible (Kapborg and Bertrö 2002).

Using interpreters is a way of bridging this gap. As Myers and Newman (2007) point out, however, the ambiguity of language is a problem even when respondent and interviewer speak the same language. It should be clear that interpreters do not make the problems disappear. Translating from one language to another is difficult due to subtle differences in meaning (Kapborg and Bertrö 2002). The complexity of interaction through translators become visible if we "trace" the flow of thoughts and exchange of meaning from the initial formulation of questions in the researchers mind to the point of receiving (and interpreting) an answer. First a thought is formulated. Being from Norway it is formulated in Norwegian and translated to English⁹. Already here conflicts of meaning may arise. The next step is asking the question. There are three dangers here. The words can come out differently than intended; the interpreter can understand the question in a different way; and respondents to varying degrees understand English. Some understand it perfectly but speak poorly. Some understand and speak it well while others understand little or nothing. This means respondents can patch together various degrees of English and Chichewa, causing further linguistic confusion¹⁰. As the interpreter gets the English message it is re-formulated to be meaningful in Chichewa. The

⁸ The language situation in Malawi is characterised by the asymmetrical coexistence of English as official language and the National language, Chichewa. Further 12 other indigenous languages exist (Kayambazinthu 2004). Kayambazinthu (2004) say Chichewa is dominant in the central region. This is consistent with observations in this study. Not once was a situation encountered where a respondent did not speak Chichewa.

⁹ Attempts were made to make the process as pain-free as possible. The preparation and constant revision of an interview guide as experience increased was part of this. The nature of semi-structured interviews, however, does not allow planning the way out of all language-issues, as it requires flexibility and room for spontaneity.

¹⁰ As the fieldwork progressed the researchers also picked up words in Chichewa. Thus confusion arose if we heard interpreters translating from Chichewa not using the equivalent word in English. In this sense we faced the same problem as respondents, although to a lesser extent.

respondent is addressed and the process reversed¹¹. Moving back and forth between languages may lead to both loss of meaning and confusion. Some languages are close to each other while others are different, linguistically and culturally. Some words in one language have no equivalent in its counterpart language (Kapborg and Berterö 2002).

Ørvig (2007) argues the interaction between interviewer, interpreter, and respondent is best viewed when utilising a *constructionist model of communication*. Cross-language and cross-cultural interpretation, she argues, imply construction of meaning, reality and information. This process of construction is fuelled by understandings of the world inherent in interviewers-, respondents-, and interpreters social- and cultural background and the social context of the interaction (interview). Figure 2 is an adaption of Ørvig's model. It displays the process of conducting interviews with interpreters and visualise the different elements shaping (possible) construction of reality as expressed in the final data. It captures and makes visible many of the issues discussed over the previous paragraphs.

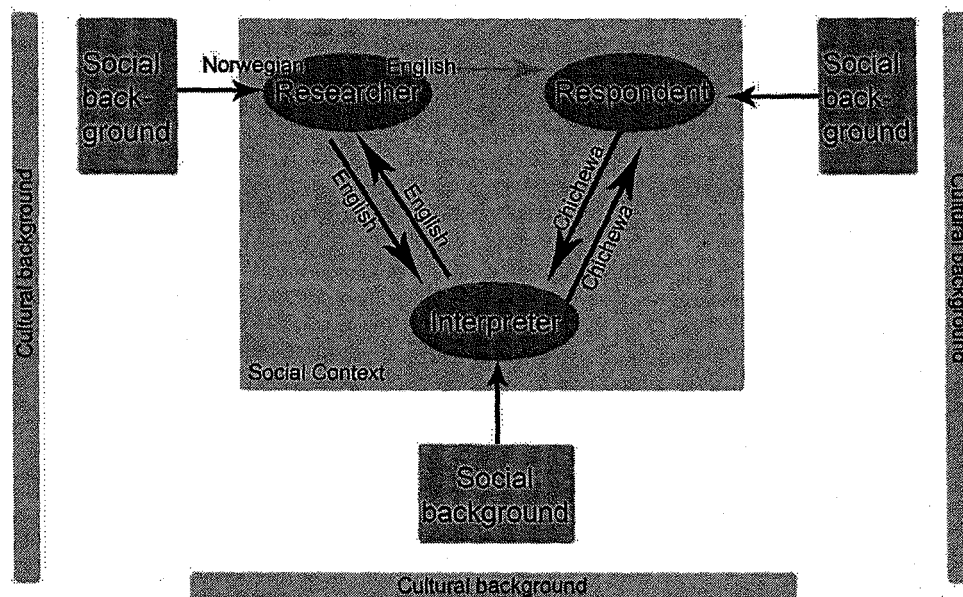


Fig 2: The process of doing qualitative interviews with interpreters. Inspired by Ørvig's (2007, 49) constructionist model of communication.

Davidson (2000, 382) add: "...interpreters do not merely convey messages; they shape, and in some very real sense create those messages in the name of those for whom they speak". The

¹¹ This way interpreting is referred to as *consecutive interpretation*. This means the interpreter listens to the entire statement of the researcher/respondent before interpreting what was said. The opposite is *simultaneous interpretation*; interpreters interpreting and translating during the conversation. This is seldom done in research and face-to-face interaction, but is common in other forums like large international political conferences (Hornberger et al. 1996).

interpreters in this study expressed concerns about the nature of Chichewa versus English and explained how verbatim translation would leave us clueless as to what respondents meant. Therefore, they explained, focus would be “getting the message across” rather than word-by-word translating. This implies interpretation, not only of language, but of meaning and indeed *creation of messages in the name of the respondent* (Davidson 2000). In retrospect this seems to have been wise. Young-Hee writes: “...*the first priority* [of interpretation] *should be given to the overall meaning, (...) not to maintaining linguistic structure*” (Young-Hee 1998, 264). Due to the ambiguity of language, however, it is not clear that loss of meaning did not occur. As a counter-strategy it is claimed to be preferable to work with interpreters fluent in the researchers mother-tounge (Kapborg and Bertrö 2002, 54-55). Temple and Young (2004, 174) reminds us that the means by which researchers choose to translate is often determined by available resources. This accurately echoes the reality of this study. The option of Norwegian-Chichewa translation was simply not available. From a research-perspective the importance lies in realising how this affects the data. In most cases respondents do not tell the story, interpreters phrase both questions and answers. Thereby they shape and influence data, and it can be argued that the reality presented is not entirely the respondents¹².

2.2.4 Researcher effects

So far we have seen how respondents were sampled, how the interviews were conducted, and how working with interpreters may have influenced data. I now introspectively investigate the researchers influence on the research-process, especially the interviews. Effects interviewers have on interviewees and their answers are commonly referred to as *interviewer effects*¹³. Further I examine attempts made to minimise these.

Researchers doing interviews are normally strangers to respondents (Weinreb 2006). In a masters-thesis this would probably be true even if field-work was carried out in my own hometown. It does, however, become more explicit when research is done in a “remote” location like Malawi. Weinreb (2006) say people in rural Sub-Saharan settings generally have limited experience with stranger-oriented interactions. Thus interviewers are even stranger

¹² This has led me to be conservative in use of quotes. When quotes are used respondents are fluent in English.

¹³ The phenomenon is widely documented. The assumption is that characteristics displayed by interviewers combined with characteristics of respondents’ influence respondents’ answers. Sin (2005) says a vast body of literature show how difference in interviewer-interviewee ethnic background affects data. Lamb and Garretson (2003) say interviewers’ gender can affect data. Bateman and Mawby (2003) show how interviewers clothing may affect answers. Hindley, Hill and Bond (1993) show how the interviewer’s cultural status often influences answers.

than the case would be in other settings. Based on experiences from Kenya Weinreb (2006) identifies two perspectives respondents tend to have when interacting with interviewers. First is *local suspicion*. Due to low experience in interaction with strangers their motives are often questioned. When materialising as interrogators asking questions about the respondents' lives, locals are more or less forced to assign motives to their presence (Weinreb 2006).

Local suspicion was encountered frequently during the fieldwork. Many had a hard time believing we had travelled from the far reaches of Norway only to learn about their management of water-resources. Suspicion became more explicit when discussing politically sensitive matters, like people of power. I suspect answers to questions about these matters were often given in ways respondents thought their leaders would find acceptable.

The other perspective identified occurs when interviewees see interview-situations as *opportunities for gain*. Researchers are often interpreted as parts of agencies involved in aid and development-work, for example NGOs (Weinreb 2006). This attitude was encountered on numerous occasions. Many saw us as experts on water or irrigation and took our presence as a sign of aid soon to come. Others thought we were there to evaluate existing projects to see if the area *deserved* more boreholes or similar schemes. If seen as having these intentions some respondents clearly had interests in making reality look certain ways, possibly giving other answers than they otherwise would.

Both perspectives (Weinreb 2006) can be related to a more general issue; the *social desirability bias*. This refers to respondents desire to be positively regarded, and tendencies to over-report some aspects of phenomena while under-reporting others (McGlone and Pfietser 2007). If we return for a moment to Øvrig's constructionist model of communication (2007, see Fig. 2) these issues can be seen as examples of how respondents social background and interview-context can influence data. The respondents understanding of whom researchers are and what their motives are may shape answers. It seems reasonable to assume that this interpretation to some degree is influenced by the respondent's socio-cultural background and past experiences. This was explicitly stated by some respondents, explaining how all Europeans visiting the area in the past had been aid-workers, religious missionaries, or a combination. It also seems plausible that how respondents see interviewers and what will be communicated if the goal is being positively regarded are linked issues. If researchers are interpreted as agents of development, this could skew the answers in specific ways.

This became very clear during our fieldwork¹⁴¹⁵. Our main counter-measure was getting to know people of the area while being honest when talking to them¹⁶. For example we repeated how our motives were non-political, non-partial to conflicts, and that we were not "developers" associated with NGO's. Instead we insisted on being taken seriously as economically limited students of Sociology from Norway. Whether or not our strategy worked is difficult to say.

2.2.5 Anonymisation

So far discussions have circled around situations before and during interviews. This does not mean there are no research-choices to be made once interviews are done. One post-interview choice concerns how much information to reveal about respondents and community in the final text. What should be considered? There is widespread debate on the basis for decision-making in social research. Wiles, Charles, Crow and Heath (2006) see four aspects needing consideration. *First* is commitment to participant's rights. This includes protection of privacy. *Second* is commitment to respect of participants. *Third* is of a different type and deals with researcher's commitment to knowledge. This includes rights for others to know, for example, how specific organisations work. *Fourth* is commitment to promotion of respect for social science, as to avoid "spoiling the field" and protecting researchers (Wiles et al. 2006).

These aspects can be divided in two broad categories; one concerned with researcher's obligation to respondents, another dealing with researcher's relationship to science. When applied to anonymisation these are conflicting perspectives. The commitment to rights and respect of respondents can be seen as blocking commitment to knowledge. On the other hand the quest for illuminating readers may endanger respondent's integrity. I have given more weight to the latter point. I have chosen to anonymise extensively, not only respondents, but villages, a local river, a nearby trading-centre, and traditional authority. Revealing any above-mentioned name could endanger respondents' integrity. This extensive anonymisation does,

¹⁴ At the end of interviews we asked if the respondent thought we had missed anything and if there were other things we needed to discuss. We were often asked if we were pleased with answers, and if aid in terms of materials, money or expert knowledge would arrive shortly.

¹⁵ One particular incidence deserves mention. One of our first days in the area we were invited to look at the irrigation farming-site. This was before we knew about the current state of the system, and about when work normally took place. As we approached the site we heard several cries in Chichewa and upon arrival we found the fields full of eagerly working people. Our interpreters later revealed that the screams could be translated to something like "They're coming!". At later stages we learned that it was not on a work-day, and as we shall see the irrigation scheme has collapsed. People wanted to impress us, in the hope that we were *developers*.

¹⁶ I and Sverre Bjørnstad were accommodated with a family close to the community studied. Thus we frequently met respondents outside interviews, giving us the chance to build trust and establish *who* we were.

however, deserve discussion. The studied communities are small in size. One village in the borehole case-study has between 30 and 40 households. Had I named the village, reconstruction of informants identities would be a simple task for anyone vaguely familiar with the village. The same goes for villages in the irrigation scheme. They are small, transparent communities. By keeping villages anonymous the borehole-case is reduced to 1 out of 120 villages with a project like this in the area. Similarly the irrigation project is reduced to 1 out of a dozen similar schemes by the same river.

A counter-argument is found with Nespor (2000) claiming fieldwork by default implies public visibility. You are present at particular time-spatial points and this makes reconstruction of identities from written accounts easy for others who were there even if names are removed (Nespor 2000, 547). In this study the point cannot easily be overlooked. We were several researchers in the area at the time; three of us "*Azungu*"¹⁷. During the period I saw no others with the same complexion. This made us exotic and I suspect people knew well where we had been, who we talked to, and what topics we were interested in¹⁸. I do not doubt the ease with which someone from this area could reconstruct both identities of people and localities.

Concealing identities is still justifiable. Much material is "political", dealing with people of power and issues where groups have conflicting interests. This thesis should not be part of legitimising arguments on any side. In the event that anyone involved in conflicts reads the thesis and manage to identify people or places I hope accusations made with basis in it will have less legitimacy than if names were included.

Adding thrust to his argument against anonymisation Nespor (2000) adds gaining access to research-sites produce a cast of "tangential" participants such as administrators, managers and officials negotiated with for entry. In most cases these have knowledge that makes recreation of identities uncomplicated (Nespor 2000, 547-548). If the goal is total confidentiality this poses challenges also for my study. To access villages permission from the Traditional Authority, Group Village Headmen and Village Headmen were needed. Discussions with officials from NOGs must also have given their administration insights in what we were

¹⁷ This is Chichewa for *white person, European or Englishman* (Paas 2005, 445)

¹⁸ This was made clear to us on several occasions when walking around the local trading centre. People whom we had never seen or spoken to as respondents shouted things like "*Give me a treadle pump!*" or "*We need a borehole in our village!*", clearly indicating that knowledge about our inquiries.

doing. If the Traditional Authority, his staff or any of the above-mentioned people should read this I have no illusions about them not being able to identify places and people.

This might seem to render anonymisation futile, but I argue otherwise, for the same reasons as earlier. Had I kept names of individuals and communities in the manuscript, powerful figures could use it to underline political points or in other ways exploit the work. The way I have presented the results of this thesis, opinions and arguments are seldom individual-specific, there are several *potential* sources. Thus blaming one person will be difficult. Anonymisation is no guarantee against exploitation, but will hopefully make it more difficult.

As we have seen there are counter-arguments to anonymisation. One of the best arguments for anonymisation, however, is that it strengthens data's reliability. Lyenda (2007) argue that since many people in sub-Saharan settings are used to expressing (true) thoughts about political issues being associated with danger, assurance of non-recognisability is vital. Finally anonymisation is established as a scientific norm; it is an unwritten assumption of most qualitative projects (Laoire 2007, 377). Over the last paragraphs I have scrutinised its need in this study. I do not see it as my task to break scientific norm, and have reached the conclusion that points favouring total anonymisation outweigh those against.

2.2.6 Analysis of data

A final point of vast importance to the way this thesis looks is handling and analysis of raw data. Two stages can be separated; *in-fieldwork* preliminary analysis and post-fieldwork handling and analysis. The first stage began during interviews. Both interviewers were equipped with low-tech gear; writing-tools and notepads to record what was said¹⁹. Each day 1-3 interviews were carried out. Between and after interviews time-consuming and systematic preparation of the data was done. Doing this allows for refining questions for later interviews and developing new roads to inquiry *during* research (Pope, Ziebland and Mays 2006). Being two allowed for double-checking and discussion if problems were encountered. In praxis what we did was writing clean accounts on laptops as close to verbatim as notes and memory allowed. On days with no electricity work would pile up, causing frustration and fading memory of the interview. Taking detailed notes during interviews was thus vital.

¹⁹ Recording interviews as video or sound for accurate transcription of what is said is common in qualitative research (Pope et al. 2006). Given the circumstances of this fieldwork it was not seen as a feasible strategy. Limitations in access to electricity, batteries, and the non-verbatim nature interviews given the use of interpreters are all factors contributing to the choice.

The second stage commenced upon arrival in Norway. The raw data consisted of massive amounts of text from interviews. To analyse this, a combination of inductive and deductive approaches was adopted. When conducting interviews and fieldwork I had yet to decide how to attack the matter theoretically. Although some thoughts were formulated during the period, guiding to some degree what questions to ask, the data is what guides applied theory, not the other way around. This is consistent with the inductive method (Draper 2004). On the other hand it should be noted that as fieldwork progressed and ideas about applying institutional theory were formed, questions were fitted to capture what institutional theory deems essential.

When analysing, the aim is to aid understanding in the complexity of the raw data through developing summary themes or categories (Thomas 2003). Here the process of “*data reduction*” was guided by theory and past research, making it partly deductive. The realisation of how to reach this theoretical guide was, however, mostly inductive²⁰. As analysis began the raw material was read several times to identify themes and categories relating to the cases of study. One segment of each interview was dedicated to explicit rules, forming a natural category or theme of analysis. Further a category of attitudes towards general modes of behaviour in different situations, by different categories of people was identified. This includes attitudes about personal action and motives as well as the actions of, and motives ascribed to others. Thirdly a category of attitudes and beliefs about power-relations was identified. This included two subsets; general power relations and power related to management of the particular resource in question. This category includes beliefs about the way ones identity affects relations to other people and groups of people. Through rigorous and systematic reading of the raw data segments of interviews were coded enabling analysis on the particular theme, documentation of relationships between themes and identification of themes of importance to respondents. Through this process similarities and differences across sub-groups could also be explored (e.g. *traders* vs. *true villagers* - see chapter 4.2.1)

²⁰ The stark distinction often drawn between deductive and inductive methods seems to be drawn along the academic quarrels often seen between advocates of *qualitative* and *quantitative* methods. In writing this thesis I have come across many dogmatic descriptions of what qualitative researchers *must* and *must not* do; deductive reasoning frequently placed in the latter category (e.g. Draper 2004). The distinction appears artificial, as the two can hardly be described as mutually exclusive categories in practice.

3. THEORY

3.1 Social institutions

Over the last years there has been a growing interest in studying and understanding institutions in the social sciences. Institutional theory is applied to academic thinking on a wide range of phenomena and topics²¹. This thesis utilises the social-institutional framework as a theoretical point of departure to better understand the governance of two common pool resources. Here I explore the institutional way of looking at social reality in detail. I link institutional theory to the sociological and social-scientific tradition before I elaborate on my understanding of the framework and how it relates to common pool resource governance.

Giddens (2006) define *sociology* as the study of human social life, groups, and societies. He adds how sociologists most important task is shedding light on “...*why we are as we are and why we act as we do*” (Giddens 2006, 5). I set out to study two specific cases, illuminating why people act as they do. Both cases involve groups of multiple individuals interacting. Thus the actions studied are of *social* character. Mac (2005, 66) argues sociology’s most important contribution to social science has come when working with questions on *social action*.

Social science generally and sociology particularly have traditionally utilised two (conflicting) perspectives when explaining social action²². The first is often associated with Durkheim and can loosely be described as structuralism (Layton 2005, 29). Elster (1989; 2007) label actors under these conditions *Homo Sociologicus*. The key idea is societal forces like norms “dictate” behaviour (Gregersen, Johnson and Segura 2004). A contrary perception is found in *rational choice theory*. People are seen as free individuals, deliberately making decisions based on available information. Coleman and Fararo (1990, xi) asserts the main difference between rational choice theory and other sociology to be the idea of *optimisation*. Actors achieve this by maximising utility, minimising costs or other means. This assumption, the *rational thesis* or *methodological individualism* originates in neoclassical economy. Thus actors under these assumptions are referred to as *Homo Economicus* (Elster 1989). Even if economists developed the argument, its application in other disciplines is common. Sociologists often apply it as an actor/agent-model counterpart to structuralism (Mac 2005).

²¹ Social institutions have gained interest in history, economics, sociology, political science and general social theory (Goodin 1996, 1-19). Thus the possible topics of study are countless.

²² I am aware that social science utilises a myriad of theories to describe and explain reality. I am not arguing the irrelevance of theories operating outside the dichotomy I sketch; rather I want to show one of the overarching aspects of much other theoretical dispute.

To oversimplify, the main question of sociology is whether the *actor* or social *structures* “makes decisions”²³. This, of course, is really not a question of either/or and a simplistic account like this will overlook many academic nuances. To position myself I find it hard to refute sociologic insight about human behaviour as partially guided by structural forces. On the other hand I don’t adhere to depressing notions of people as *structural dupes*, or in the words of Elster: “*mindless plaything(s) of social forces*” (Elster 1989, 99)²⁴. It is in the difference and space between the approaches that I find my main interest in institutional theory. Ayres and Braithwaite (1992) made a solid point when claiming:

“Much of contemporary social science is a stalemate between theories assuming economic rationality on the part of actors and theories counterposing action as variously motivated by a desire to comply with norms (...) or to simply act in habituated behavioural sequence. We think robust policy ideas are most likely to be discovered when we pursue areas of convergence between analyses based on *Homo Economicus* and those based on *Homo Sociologicus*” (Ayres and Braithwaite 1992, 51)²⁵

I see theory of social institutions as an example of an area where the trails of thought meet. Goodin (1996) observes how sociologists studying institutions often emphasise individual behaviour as shaped by a larger group or setting. Pettit (1996) add that it allows sociologists to embrace the idea of individual choice. Thus institutional theory has room *both* for ideas of behaviour as shaped by structures *and* the notion of people capable of choice. If the assumptions are correct the institutional framework cannot easily be overlooked if human behaviour is your field of study.

By now we know *why* institutions are important, but we don’t know *what* they are. When speaking of institutions in sociology the concept can be difficult to grasp since they almost exclusively refer to intangibles (Gregersen et al. 2004). One example is *the family*, a concept often referred to as a *social institution*. This, however, does not denote a concrete family

²³ Mayhew (1980) say American and European scholars have been divided historically; Americans on the individual actor-side, Europeans as structuralists. He, however, relates methodological individualism to psychology. Instead of *Homo Economicus* vs. *Homo Sociologicus* he separates *psychologism* from *sociologism*. Elster (2007) stresses the importance of psychology in understanding social phenomena. He similarly recognises psychology’s influence on methodological individualism in social science.

²⁴ Giddens (1984) use *structural dupes* in reference to actors in theory where structure is the *only thing* guiding action. Individuals here have no choice, “duped” by structures in which they, through no choice, happen to live.

²⁵ The dichotomy is not exclusive to social science. The philosopher Bicchieri (2006) separates *the heuristic route to choice* from *the deliberational route*. The latter means assessing situations, gathering information, evaluating possible consequences, assessing probabilities of each consequence, and acting on the basis of this to maximise expected utility. The former contrasts choice as guided by default rules stored in memory, cued by contextual stimuli. DeLanda (2006) refers to structuralism as *macro reductionism*, and strict adherence to methodological individualism as *micro reductionism*, implying they both miss crucial aspects of reality.

living around the corner. The family as a social institution refers to a: "...set of rules and social and moral norms which shape the way people live "in families" in a specific society." (Gregersen et al. 2004, 7).

Rules, then, is a key to understanding what institutions are. A famous definition of institutions is found in the first pages of Nobel-prize winner Douglas North's *Institutions, Institutional Change and Economic Performance* (1990). Very bluntly he depicts institutions as "*the rules of the game in a society*" (North 1990, 3). More formally he elaborates, saying they comprise: "*the humanly devised constraints that shape human interaction*" (North 1990, 3). Thinking of institutions as rules makes the intangibles tangible. It eases the process of separating them from the things we suspect they influence. North (1990) and Scott (2001) have suggested an analytical distinction between *institution* and *organisation*. In the example of families as social institutions, specific families "around the corner" are best seen as organisations. The rules applying to organisations - the rules that families in general follow are institutions.

To illustrate with the cases studied in this thesis, then, they will not be institutions. The irrigation system is *not* an institution. The borehole is *not* an institution. These are specific cases, better understood as organisations. These, however, carry with them (and encounter) institutions. These will be the focal point of my study. Note, however, that institutions affecting organisations do not necessarily originate in the organisation. In the study of how institutions affect organisations it is common to study the *institutional environment* as forcing itself on the organisation from outside. The surroundings are seen as imposing structure or practice that individual organisations must follow, either because it is taken for granted as the proper way to organise or because it is required by legal or other rule-like frameworks (Scott 2001). On the other hand organisations collectively shape and re-shape their institutional requirements and environment (Scott 2001). Thus organisations face *both* internal and external institutional influence. Capturing institutions originating both within and on the organisations exterior in the two cases studied here seems vital.

So far three things have been done. We have seen two perspectives on social action. Analyses of social phenomena will reach different conclusions if resting on assumptions of actors as *homo sociologicus* or as *homo economicus*. Further I have argued that institutional theory allows utilising insights from both strains of thought. Finally I have shown how institutions can be separated from organisations by thinking of institutions as *rules*.

3.2 Rules and incentives

Let us examine the notion of rules in more detail. We depart by relating the idea of institutions as rules to the past discussion on Homo Sociologicus and Homo Economicus. Seeing rules as anything but a *structuring* element is difficult. Laws are explicit examples of this. Consider a mundane red light in traffic. This is a marker saying it is *forbidden* to proceed without waiting for the appropriate signal. It is a conscious attempt by an agency to structure behaviour, minimising risks of dangerous situations. If all auto motorists conformed to the law of traffic it would make a powerful defence for an understanding of human behaviour as based on Homo Sociologicus; humans are “duped” by structures, both explicit and implicit.

We know, however, since non-compliance occurs frequently that choice is indeed involved²⁶. The rule may not always be enough to “guide” behaviour in desired directions. Being late for important meetings can lead drivers to pass red lights to arrive on time. In these events they probably look around, considering the surroundings before making a decision. The deliberations prior to non-compliance sound much like those of Homo Economicus. The example is simple, and presents little but an example of a situation where I find application of institutional theory to be a better alternative than the above-mentioned possibilities. The actor makes *choices* and is capable of deliberation, but within constraints. The law of traffic is part of this, but if custom in the neighbourhood is to disregard red lights if no other cars or pedestrians are present, this is also a “rule”. Similarly, the social humiliation associated with being late could by far outweigh the potential penalty inflicted by keepers of the law.

3.2.1 Different types of rules

The example above hints at rules being more than the paragraphs found in books of law. Indeed, “rules”, as understood in the institutional literature is a broader category. They can, of course, be rules of law, but can also be deeply vested in human minds as codes of conduct (Scott 2001) I now explore ways of thinking about and discussing rules in the institutional literature.

²⁶ In Norway there were 64900 offences reported against the law of traffic in 2006 (Statistics Norway 2007)

3.2.2 ADICO

Elinor Ostrom has developed what she calls a “grammar” of regulatory rules, the ADICO syntax. This is useful for analysing action-situations and the *institutional statements* found in them. The red light above can serve as an example of an institutional statement. Every letter of ADICO represents one component, and if all components can be identified in an action-situation we are, according to Ostrom, dealing with a *rule* (Ostrom 2005, 139-140)²⁷.

The components of the syntax are: Attributes, Deontic, A/m, Conditions, and Or else. Looking at the syntax in detail will be fruitful since it allows for discussion on the two cases of study in this thesis with precision. We can also gain a clearer understanding of what constitutes *rules* in general. Thus it is not only a linguistic tool of precision; it furthers our understanding of what institutions are. The next paragraphs are mainly based on Ostrom (2005, 139-150). While reviewing this material examples are given. These resemble the cases studied, but note that they are imaginary and not based on fieldwork-data.

The first component is *Attributes*. This refers to whom the institutional statement applies. All institutional statements apply to a subset of participants in action-situations ranging from one to all participants. These can be individual attributes if the actors are individuals. Examples are values ascribed to categories like gender and age²⁸. On the other hand the attributes could also apply to organisational variables like size of membership or geographic location of headquarters (Ostrom 2005, 141).²⁹

Next is the *Deontic* component. This separates three types of rules. *Prescriptive* statements use the operative phrase “must”. Opposite are *proscriptive* statements, with the operative phrase “must not”. In-between are *permissive* statements where the operative phrase is “may” (Ostrom 2005, 141-142). This can easily be recognised from everyday-experience. For using boreholes it is likely that you have to pay a fee to be a legitimate appropriator. If so the

²⁷ In situations where only ADIC can be identified Ostrom say we see a *norm*. When the three components A/C are found, shared action strategies are what you see (Ostrom 2005, 140). The term “rule”, as I understand it, is “wide” category encompassing many phenomena. Ostrom note how it is difficult to differentiate between situations of ADIC and ADICO and that for simplicities sake both are often called norms. Bicchieri (2006) use the word *norm* similar to how Ostrom (2005) use the term rules. Bicchieri argues that norms are in fact “the rules we live by” (Bicchieri 2006). One argument for utilizing the ADICO syntax is that it that it allows for precise description of and identification of similar phenomena referred to by different scholars with different words.

²⁸ Around a borehole there can be different rules defining what the tasks of men and women are. Women collect water, men don’t. Similar rules can apply to age. Children can be forbidden to linger at the site.

²⁹ Rules can for example differ according to where you are located in the organisational hierarchy. Someone in a committee may be under different rules than an ordinary appropriator of the resource in question.

operative phrases in use are: “you *must* pay a fee in order to draw water”, “you *must not* draw water without paying a fee” or “you *may* draw water after paying a fee”.

The “*I*” of ADICO is “*A/m*”. These are specific descriptions of working parts in action-situations to which institutional statements refer (Ostrom 2005, 148). In the above example the *A/m* would be the action of drawing water. Sometimes, however, the *A/m* specifies states of affairs or outcomes rather than actions. In rules concerning common pool resources the *A/m* tell what users can extract, or how much they must contribute (Ostrom 2005, 148).

We now reach the fourth component. Here Conditions that define when and where an institutional statement applies are described (Ostrom 2005, 149). Examples can be rules applying only under particular weather conditions or certain seasons of the year.

Fifth and last is the “Or else”-component. This is the consequence an institutional statement assigns when non-compliance with the other parts of that statement is detected (Ostrom 2005, 149-151). In other words this represents possible reactions if rules are broken. In the borehole-example this element could be expressed as simple as: “Every villager wanting to draw water from the borehole must pay a monthly fee *or else* she or he will not be allowed to draw water”.

One advantage of the ADICO-syntax is the broad definition it allows for the term *rules*. We are not limited to rules found in books of law; the syntax is just as applicable when analysing informal rules like societal norms. As Homo Sociologicus (see e.g. Elster 1989) the everyday behaviour of people can be interpreted as conforming to what structures and norms dictate. The ADICO-syntax allows us to describe and analyse these structures as *rules* – rules one can follow or violate. These rules are less explicit than rules of law; they are often pure social facts, taken for granted. They are highly intangible, and the ADICO syntax is a tool for visualising and detecting them. Figure 3 displays the now much used example of a borehole, with all components of the ADICO-syntax indicated.

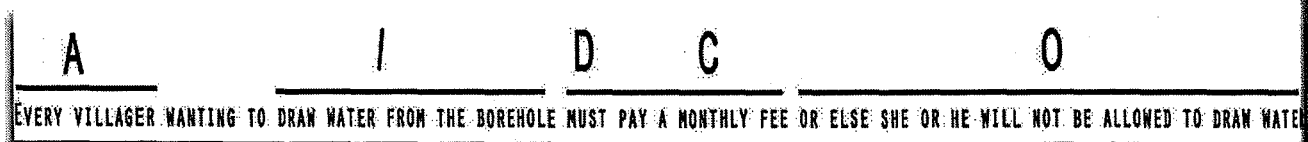


Fig 3: The components of the ADICO-syntax in a stylized example

3.2.3 Three pillars of institutions

Thinking of institutions as rules is not exclusive to Ostrom. Scott (2001) summarises the literature and shows how scholars of different background emphasise different aspects when discussing institutions. He divides the literature in three pillars; *three pillars of institutions*. These are assumed to make up and support institutions in different ways, but are not mutually exclusive. They include the *regulative*-, the *normative*-, and the *cultural-cognitive pillar*. In the following I look at these while linking them to ADICO-syntax.

Scholars associated with the *regulatory* pillar are distinguished by the prominence given to explicit regulatory processes; rule-setting, monitoring, and sanction activities. According to Scott (2001) the regulatory process in this conception involves capacity to "...establish rules, inspect others' conformity to them and (...) manipulate sanctions – rewards or punishments – in an attempt to influence future behaviour" (Scott 2001, 52). We must, however, note that Scott does not speak exclusively about formal written-down rules of law as part of this pillar:

"...These processes may operate through diffuse informal mechanisms including folkways such as shaming or shunning mechanisms, or they may be highly formalized and assigned to specialized actors, such as the police and courts" (Scott 2001, 52).

The relation to Ostroms (2005) ADICO-syntax is clear. The regulatory pillar deals with rules in a straightforward way and applied as described in the previous chapter the ADICO-syntax provides a precise tool for description of the institutions in this pillar.

Second is the *normative* pillar. Emphasis is normative rules introducing prescriptive, evaluative and obligatory dimensions to social life. These normative systems include what Scott calls *values* and *norms*. Values are "...conceptions of the preferred or the desirable, together with the construction of standards to which existing structures may be compared" (Scott 2001, 54-55) while norms "...specify how things should be done; they define legitimate means to pursue valued ends (Scott 2001, 55)³⁰. Again, if the ADICO-syntax is applied we see that both norms and values fit the broad category of rules. Having "*conceptions of the preferred or desirable*" (Scott 2001, 54) combined with standards to compare existing structures also mean that a conception of how things *should not be* exists. If more people

³⁰ The understanding of institutions as normative systems is, according to Scott, the understanding of institutions historically embraced by sociologists. He lists notable figures like Durkheim, Parsons and Selznick as followers of this strain of thought (Scott 2001, 55).

share similar conceptions they can send more “negative feedback” to those failing to comply. Thus in structure it holds the same components as a rule. If one suspect such mechanisms are at play, describing and discovering them can be achievable through the application of Ostrom’s (2005) ADICO-syntax.

Third and finally we reach the *cultural-cognitive pillar*. Authors categorised here stress the centrality of institutions cultural-cognitive elements. These are: “...*the shared conceptions that constitutes the nature of social reality and the frames through which meaning is made*” (Scott 2001, 57). In this tradition one takes seriously the cognitive dimensions of human existence: “...*mediating between the external world of stimuli and the response of the individual organism is a collection of internalized symbolic representations of the world*” (Scott 2001, 57). It recognises that internal interpretative processes are shaped by external, cultural frameworks. Compliance, then, for cultural-cognitive theorists occurs in many circumstances because other types of behaviour are inconceivable; routines are followed because they are taken for granted as the “proper” way to do things (Scott 2001, 57).

The phenomena identified under this pillar can also be described as rules with the ADICO-syntax (Ostrom, 2005). People, however, may in many cases not be aware of their existence as *social* rules. This understanding of institutions resembles that of Douglas (1986) who says the strongest institutions are those “camouflaged” as nature. This mix of sociality and nature becomes particularly potent when analogies are made to natural order. In these cases groups of people are often seen as holding *natural* qualitative differences (e.g. women are *naturally* better in the kitchen) (Douglas 1986, 45-53). Thus action and patterns of behaviour is repeated and made routine because we believe they are *natural* state of affairs.

From Scott’s account of the three pillars (2005) we can deduct a clear difference in the concreteness and tangibility of institutions in different pillars. At one end of the scale (the regulative pillar) they can be as concrete as solid laws, whereas rules on the other side of the scale (the cultural-cognitive pillar) can be extremely abstract and hard to detect. A challenge for this study, then, is detecting rules of both kinds influencing governance of the common pool resources studied.

3.2.4 Incentives

Another useful term for discussing institutions is *incentives*. For North (2005) this is one of the most central terms of institutional analysis. For him the institutional framework consists of a *structure of incentives*. At any given point individuals are surrounded by, have internalised and in other ways are under the influence of a multitude of institutions. These institutions (rules) can, as we have seen, give conflicting guidance as to what action is preferable. For North the web of these institutions make up a structure of incentives.

The description of incentives is very similar to the broad definition I have previously given to the terms institutions and rules. A rule of law explicitly gives incentives to act in particular ways. Similarly more informal rules like norms can be seen as providing incentives to act in certain ways. Do (a) and your surroundings award you, do (b) and be punished, do (c) and people don't care. Formulated like this the examples can also be placed within Scott's framework of institutional pillars (Scott, 2005). The rule of law (as incentive) would be in the regulative pillar while norms (as incentives) would be in the normative pillar.

Schmid (2004) speaks of incentives in a way that closely resembles how Scott (2001) describes the cultural-cognitive pillar of institutions. Schmid talks of a constant *feedback* to individuals from the broader society. This feedback is positive or negative and in most cases it breeds conformity (Schmid 2004). From the accounts above it seems clear that also incentives can be described as ranging from concrete, tangibles (like rules of law and the price of a given object) to very abstract normative and cultural processes in individual and group identity.

Economists frequently use the term *incentive* to explain human action. One example is Easterly (2002) who travels the world, showing how *good* and *bad* incentives stimulate favourable and non-favourable behaviour. Easterly uses the word incentive essentially in the same way as past authors used institution. There is, however, a distinction between the terms. Schmid (2004) say incentives can be seen as beliefs about the cost of certain actions. In many cases, these costs (or perceived costs) are *created by* institutions. One possible cost of violating a law is going to jail. On the other hand there are incentives that are not created by institutions. Upon deciding whether or not to indulge in cliff-jumping, for example, the actor has to weigh the thrill (which to some extent can be argued to be social in character and influenced by institutions) against the possibility of blunt death, a very real and "hard" incentive indeed.

3.3 Common pool resources, social dilemmas and collective action

We have now established an understanding of what I mean when I speak of institutions. Roughly they are *rules*. Institutions, however, are very general phenomena found wherever humans interact and wherever organisations manage to be somewhat durable. I am not interested in the phenomena of institutions *as such* in the same way I am not interested in water *as such*. In this thesis my interest lies in how institutions affect 2 particular groups and their governance of common pool resources. In this chapter I examine how institutional literature has linked common pool resources to institutions. I also look at some of the problems associated with common pool resources and how institutions are sometimes seen as possible routes of escape from these.

For this reason it is imperative to understand what *common pool resources* are. I begin looking at the concept, relating it to my two cases of study. Further I look at the desired notion of collective action. In-between these concepts are social dilemmas, another element we must understand before we can talk specifically about boreholes and irrigation schemes.

3.3.1 Common pool resources

In everyday language *commons* refers to a diversity of resources, facilities and property involving aspects of joint ownership or access (Dietz et al. 2002). This use of the word makes it applicable to a wide range of physical structures. In this thesis I apply a definition not far from this mundane understanding. Dietz et al. (2002) defines *common pool resources* as:

“...a valued natural or human-made resource or facility that is available to more than one person and subject to degradation as a result of overuse (...) Common pool resources are ones for which exclusion from the resource is costly and one person’s use subtracts from what is available to others” (Dietz et al. 2002, 18)

Correspondingly Ostrom, Gardner and Walker (1994) and Ostrom (2005) show common pool resources are a particular class of goods sharing two characteristics. These are (a.) the difficulty of excluding individuals from benefitting from the good, and (b.) the subtractability of benefits consumed by one individual from those available to others. Both cases in this study display these characteristics³¹.

³¹ Both cases combine human-made structures and natural resources. The borehole has natural groundwater while the human-made pump and hole is needed for water to reach the surface. The irrigation system utilises water from a river as natural resource but has many human-made parts like canals and pumps. In both cases the humanly constructed parts are subject to degradation if overused without proper maintenance. Excluding

Common pool resources are regulated by a large diversity of property right regimes. These include broad categories of government ownership, private ownership and ownership by community. In addition we have situations where no property rights define use and access to the resource. In these situations we talk of the commons as being under an *open-access regime* (Dietz et al. 2002). All categories provide different sets of rules and different ways of making decisions about the resource. In other words; different categories come with different institutions. All categories have been identified in many locales and in many different variants. At this point, however, no consistent evidence exists to support that any type of regime is best suited for all kinds of common pool resources (Dolšák and Ostrom 2005).

3.3.2 Social dilemmas created by the characteristics of common pool resources

The characteristics of common pool resources; difficulty of exclusion and subtractable yield (Ostrom, Gardner and Walker 1994 and Ostrom 2005), create challenges that groups of appropriators need to overcome if the resource is to be sustained³². In the following I examine *social dilemmas* arising for appropriators of common pool resources, often described as common pool resource dilemmas.

Social dilemmas arise in situations where individuals are forced to choose between the short-term interest of one self and the long term interest of the group, resource, *and* one self (Kollock 1998). A common assumption is that when short term, selfish choices are made results are devastating to the community (Campbell, Bush, Brunell and Shelton 2005, 1359). In other words social dilemmas are identified in situations where "*...individually reasonable behaviour might lead to situations in which everyone is worse off than they might have been otherwise*" (Kollock 1998, 183)³³. Ostrom (2005) defines social dilemmas slightly different:

"Social dilemmas (...) occur whenever the private returns to each participant are greater than their share of a joint return no matter what the other participants do. If the structure of a one-shot social dilemma is not

people from the resource is costly in both cases. Permanent surveillance would be one possibility. In both cases one persons use extracts from what is available to others at that point in time.

³² The term "appropriation" is applied to the process of withdrawing units (in this study irrigation water or drinking water) from the common pool resource. Any individual doing so is an *appropriator*. Here I follow the tradition from Plott and Meyer (1974) through Ostrom, Gardner and Walker (1994) and Ostrom (2005).

³³ Elster (2007, 135-136) notes that while behaviour is not necessarily rational, most action can be seen as *reasonable* from the actor's point of view simply because people have a desire to act *for a reason*. Thus people over-appropriating could simply cite their extra gains as reason for doing so.

changed, and individuals pursue their own immediate, objective outcomes as the only value taken into account, individuals will not achieve outcomes that could leave everyone better off" (Ostrom 2005, 37)³⁴.

There are two dilemmas particularly likely to arise in situations involving common pool resources. Both involve situations where individuals are tempted to follow their own short-term interest, thereby producing outcomes that are not in anyone's long-term interest (Ostrom et al. 1999, 278-279). First and perhaps most obvious is *the problem of overuse* (Dietz et al. 2002) or the problem of *appropriation* (e.g. Ostrom, Gardner and Walker 1994). The first characteristic of common pool resources is the subtractability of resource units once extraction occurs. Thus there is a clear relationship between one individual's use of the resource and the availability of the resource for others³⁵. Dietz et al. (2002) says:

"One person's harvest of fish, water or timber subtracts from the amount available at any one time (and potentially over time) for others. Because common pool resources are subtractable they can be easily congested, overharvested, degraded, and even destroyed" (Dietz et al. 2002, 19)

In a later account Janssen and Ostrom (2007) adds that the main problem arises when multiple appropriators harvest from a single common pool resource. They go on to note that most textbooks in resource-policy presume appropriators in these situations act like selfish Homo Economicus, thus overharvesting from the resource.

From these accounts the dilemma is as follows: you benefit in the short-term by appropriating large quantities of a resource. On the other hand, if all appropriators do this the risk of degradation and destruction of the resource is substantial. Ideally all appropriators would withdraw small quantities for example in accordance with a set of fixed rules. This way, one could hope, the common pool resource could be sustained. The problem is that if only one or a few appropriators follow this course of action the individual (and group) gain will be minimal. You end up with few resource-units, while over-appropriators manage to grab notable amounts before resource perish. So what do you do? *That* is the dilemma.

³⁴ We must note that social dilemmas are a universal problem, not merely a local phenomenon of importance to the two cases of study in this thesis. Ostrom (2005) calls it a pervasive problem repeatedly recognised in great works of political philosophy, citing among other Hobbes and Rousseau who both touched the theme. Thus it is my position that attempts at understandings the mechanisms involved in social dilemmas and their possible resolutions are of great general importance to all social sciences, sociology included.

³⁵ In the case of a borehole you cannot have more than one person drawing water simultaneously. This means that while one person appropriates she subtracts from other peoples access to and possibility to benefit from the resource at that particular time.

The second problem causes a similar dilemma and is labelled *the free-rider problem* (Dietz et al. 2002) or the problem of *provision* (Ostrom, Walker and Gardner 1994). Again individual difficulty lies in deciding between personal short-term gain and group-welfare. This problem is mainly a result of the difficulties involved in excluding possible beneficiaries from deriving benefits of the resource. Dietz et al. (2002) say:

"If it is not practical to exclude a user nor to force that user to contribute to developing and maintaining the resource, the non-contributing user is called a free rider (...) Thus, a core problem related to the use of common pool resources is the cost of preventing access by potential users unless they agree to abide by a set of rules" (Dietz 2002, 19)³⁶.

Kollock (1998) sees the two dilemmas as a distinct class of social dilemmas; *commons dilemmas*. He goes on to add that these dilemmas affect *all* common pool resources. We know, however, that not all common pool resources are affected in the same way. How it is affected depends in part on the choices made by appropriators and in part on the resources *carrying capacity*. This is a function of the resources replenishment rate – different resource pools are renewed at different rates (Kollock 1998). For the cases in this study the replenishment rates are not purely natural phenomena because both cases in part consist of human-made physical structures. Thus replenishment rates depend on efforts of maintenance on the structures. This makes them particularly vulnerable to the problem of free riding.

The problems described here have been contemplated, debated and attempted solved for decades. A worst-case scenario of over-use and destruction was legendarily described as a "tragedy of the commons" by Hardin (1968). On paper the tragedy may seem un-avoidable. Many years of research on common pool resources have shown, however, that tragedy does not appear as often in real life as we might fear from theory. Dietz et al. (2002, 4) shows how common pool resources are frequently governed successfully; "*comedies of the commons*" are seen as frequently as tragedies. The existence of the tragedy is not under debate, but the above account hints at the existence of solutions and that avoiding tragedy is indeed possible.

This is the second point in this thesis where the importance of understanding institutions arises in very explicit form. More importantly the possible solution of social dilemmas in

³⁶ Let us continue using a borehole as an example. A borehole is a humanly created structure requiring maintenance. This is costly, and ideally all appropriators would contribute money or labour in agreed-upon amounts to avoid the eventual destruction of the structure. Someone who appropriates without upholding her part of such an agreement would be a *free rider*.

relation to common pool resources hint at the importance of grasping how institutions affect these types of resources. The fact that not all common pool resources are destroyed display the insufficiency in models of Homo Economicus for explaining common pool resource outcomes. Assuming no free will seems naïve, however, especially knowing how some common pool resources indeed end in tragedy. In this I find support for the idea that institutions might affect commons-outcomes.

3.3.3 Theoretical solutions to the Social dilemma

So far I have shown what social dilemmas are and how they become apparent in common pool resource-situations. Finally we have seen that outcomes differ. Sometimes dilemmas are solved, at other times tragedy strikes. In the following I focus on how theorists see it as most likely to achieve the former outcome. Kollock (1998) sees the literature as divided in two sets of answers; *strategic* and *structural* solutions. The arguments of these camps rest on different assumptions about actors and the ways they make decisions in situations of social dilemma.

Authors focusing on strategic solutions assume egoistic actors. It is through choices made in social dilemma-situations that possible solutions arise. One example is mechanisms of reciprocity seen as results of individual (egoistic) choices (Kollock 1998, 196-197). Another example is *social learning*, a process where the (rational) actor is assumed to learn from strategies of other, successful actors. Over time these processes might push groups to overcome social dilemmas (Kollock 1998, 198). Many examples like the two exist. Common to them all are the assumptions of methodological individualism; individual actions add up and constitute the social dilemma-solution.

Structural solutions are different. They involve *changing* the rules of the game either through modification of the social dilemma or by entirely eliminating it (Kollock 1998, 199). Two approaches are often cited as examples. The first is regularly advocated by economists and involves privatisation of the common pool resource. This means breaking it up in private parcels on the assumption that individuals take better care of their own property than common property (Kollock 1998, 203). The counter-example is establishment of an authority, a *leviathan* with regulative powers over the resource. Centralising common pool resource-management with national authorities is an example of this (Kollock 1998, 203).

A third example is found with Ostrom (1990) who advocates local regulation of access and appropriation by those who use, and have local knowledge of the resource. Kollock (1998,

204) calls this approach a “third way” of escaping social dilemmas and tragedies of the commons. Sandmo (2000) stresses the importance of institutions to Ostrom’s approach:

“...the absence of private property rights does not automatically imply that the resource in question will be overexploited. When this happens, it may well be that the best reform is not privatization, but rather the development of better institutional forms for collective management.” (Sandmo 2000, 142)

3.4 Common pool resources of water and potential solutions to the social dilemma

In the following I review literature dealing specifically with common pool resources where water is the resource withdrawn by appropriators. The discussions mainly circle around structural solutions. Seeing irrigation systems as common pool resources is common. There is, however, not much literature treating boreholes *per se* as such, but many accounts of water-sources, in western societies (e.g. Jordan 1999) and in societies more comparable to contemporary Malawi (e.g. Nemarundwe and Kozanayi 2003) as common pool resources exist. Thus I am not re-inventing the wheel; I place myself firmly in a theoretical tradition that has dealt with issues like the ones I study in the past. Let us first return to the simple notion of institutions as *rules* (North 1990, 3). At this point I am interested in a specific set of institutions linked to water (common pool) resources; *water institutions*. A simple way of explaining what comprise water institutions would be to say they are rules: “...of water development, allocation and utilisation” (Saleh and Dinar 2004, 11).

Saleh and Dinar (2004) identifies three different water-management regimes, all with different institutional setups. The first is a *state-dominated institutional setup*, or a *public-sector setup* (Saleh and Dinar, 2004). In Kollock’s (1998) terms this is a structural solution to the social dilemma with a strong authority in charge. The second possibility identified is the *private water rights system*. This market-oriented model is often praised by economists for bringing about “efficient” use of water (Saleh and Dinar, 2004). This is recognisable from Kollock’s account (1998), where privatisation of the resource is seen as a potential route for escaping social dilemmas. The third alternative is control of the resource by *collective action groups*. These take many forms but a common characteristic is members of the group benefitting from the resource crafting the rules that regulate its use (Saleh and Dinar 2004, 13). This resembles Ostrom’s (1990) *third way*, regulation of access and use by appropriators possessing local knowledge. The categories are useful as theoretical constructions, but Saleh and Dinar (2004) indicate that real life-situations seldom are this clear-cut:

“...contrary to the general perception the private water-rights systems, collective action institutions and state management institutions are not alternative institutional options but complimentary institutional components (...) of the water sector” (Saleh and Dinar 2004, 12).

We might suspect this to be truer in the industrialised world, but it also resonates well with research-results from countries similar to Malawi. Nemarundwe and Kozanayi (2003) find both community-owned water sources and privately governed water sources in their study of water management and institutional arrangements in southern Zimbabwe. The ones being under private institutional setup, however, also displays many of the characteristics frequently associated with community-based water sources.

Before we move on I want to highlight a particular kind of social dilemma frequently found in irrigation systems. This is the *problem of asymmetry*. Ostrom and Gardner (1993) show how irrigating with a canal by default creates two categories of appropriators; *head enders* and *tail enders*, depending the position of their plot in relation to the canal. These groups find themselves in very different positions. Water has to flow past head enders field in order for anyone else to irrigate. A selfish head ender might take more water than tail enders and ignore the scarcity this could create for appropriators at the tail end. If, however, people with plots at the lower end receive less water than the ones at the top we can suspect they will want to contribute less money and labour for maintenance. The social dilemma is real for both groups.

In irrigation common pool resources social dilemmas are of both appropriation and provision. The appropriation problems concern the *allocation* of water to agricultural production while the provision problem concerns the systems *maintenance*. The dualism of these problems is complicated by the head/tail end asymmetry (Ostrom and Gardner 1993, 96-97).

3.4.1 Ostroms design principles for long-enduring common pool resource institutions

The example shows one way appropriators of specific resources face social dilemmas. In the worst case this end in *tragedy*. I have looked at ways theorists think this can be avoided. I now examine closer the *third way* of common pool resource-governance; the alternative to privatisation or state-control. Ostrom (1990; 1993) has studied many successful irrigation systems around the world and found a set of *design principles* that are present in most³⁷. Initially the principles were valid exclusively for *irrigation* institutions, but later work by Ostrom and Gardner (1994); Anderies, Janssen and Ostrom (2004) and Ostrom (2005) has

³⁷ Successful must not be interpreted in economic terms, but as success in long-endurance (Ostrom 1993).

been the framework of principles extended to other types of common pool resource-institutions and social-ecological systems. Thus the principles can be used as a benchmark for comparison with both cases in this study and help provide theoretical thrust to explanations of success and failure.

First are *clearly defined boundaries*. Boundaries of the service area and individuals or households with rights to use the resource are clearly defined in successful, long-enduring systems. Clearly defining a systems parts and who its rightful users are is considered vital for the potential of collective action. The problem addressed by defining boundaries is free-riding (Ostrom 2005, 260). The presence of boundaries closing the system to outsiders is thought to be an incentive to farmers in the system to contribute in ways the system demands. Ostrom cites classical literature on the topic as seeing this feature to be defining for *common property* as opposed to open access regimes (Ostrom 1993).

Proportional equivalence between benefits and costs is the second principle. Different resources have different challenges that need to be addressed in order to physically work. Some are labour and capital-intensive for maintenance, others more demanding in terms of security. The point of this principle is that not all participants in all systems manage to contribute the same, and that not all participants necessarily benefit equally from the same. An example of this is the difference between head and tail enders described in chapter 3.4. In most successful, long-enduring systems, those benefitting most from the resource are required to pay the highest amount of money (Ostrom 2005, 262-263). In general economic literature this is often referred to as *fiscal equivalence* (Ostrom, 1993).

The third principle deals with *Collective-choice arrangements*. This refers to systems where individuals affected by a resource regime are authorised to participate in making and modifying the rules (Ostrom 2005, 263). According to Ostrom:

“Resource regimes that use this principle are both better able to tailor rules to local circumstances and to devise rules that are considered fair to the participants”(Ostrom 2005, 263).

She goes on to point at problems associated with two different situations; one where a central agent such as a government is in control, another where local elites manage the resource:

“As environment changes over time, being able to craft local rules becomes particularly important as officials located far away do not know of the change. When a local elite is empowered at the collective-choice level, policies that primarily benefit them can be expected” (Ostrom 2005, 263)

Fourth is the principle of *Monitoring*. Most scholars agree that rules must be monitored and sanctioned to be successful, but the question of *who* should do this is not entirely agreed upon. Ostrom claims most durable resource regimes select their own monitors who are accountable to the appropriators and in many cases are appropriators themselves (Ostrom 2005, 265).

The fifth principle is *Graduated Sanctions*. If the operating rules of long-enduring resource regimes are violated the perpetrator is likely to receive graduated sanctions depending on the seriousness and context of the offense. The initial sanctions are often surprisingly low. An assumption is that a reason for this is the monitoring being done by participants themselves. Thus a series of pressures causes what we might call a quasi-voluntary compliance to the rules (Ostrom 1993). The initial sanction is better understood as information to the one who is caught as well as to others in the community (Ostrom 2005, 266). “*We know who you are and what you are doing - we do not like it!*”

The sixth principle found to be present in long-enduring systems is *conflict resolution mechanisms*. Users and officials in these systems have rapid access to low-cost local arenas to resolve conflicts among users or between users and officials (Ostrom 2005, 267-268).

The seventh and last principle is out of participants’ control. This is *Minimal recognition of rights to organise*. Many resource-user groups organise in a de facto manner, but are not recognised as legitimate organisations by national government. Thus it can be hard for them to do things they would otherwise do as a group; creating bank accounts or representing their member’s interests before administrative or judicial bodies (Ostrom 2005, 268-269)³⁸.

3.4.2 The role of heterogeneity on common pool resource institutions

One question frequently raised in the literature about common pool resources is whether the group of appropriators should ideally be homogenous or if heterogeneity is preferable. Ostrom’s design-principles provide little in terms of an answer. Will homogenous groups be

³⁸ There is also an eight principle; *Nested Enterprise*. This, however, characterises larger systems where governance is organized in multiple layers of nested enterprises (Ostrom 2005, 269). The cases studied in this thesis are not of this size so this principle will receive little scrutiny.

able to craft and/or sustain institutions that avoid impoverishing the resource in question better than heterogeneous groups?

The literature is divided in two camps; one claiming heterogeneity affects the commons-outcomes negatively, the other claiming positive effects (Bardhan and Dayton-Johnson 2007). Heterogeneity or *inequality* can be understood in many ways. Cultural heterogeneity, economic heterogeneity or heterogeneity in terms of appropriator's power and status in the community are all valid examples (Bardhan and Dayton-Johnson 2007). Advocates of a positive role for heterogeneity on commons-outcomes often refer to what is popularly known as the "*Olson effect*". Mancur Olson (1965) famously formulated his hypothesis:

"In smaller groups marked by considerable degrees of inequality – that is, in groups of members of unequal "size" or extent of interest in the collective good - there is the greatest likelihood that a collective good will be provided; for the greater the interest in the collective good of any single member, the greater the likelihood that that member will get a significant proportion of the total benefit from the collective good that he will gain from seeing that the good is provided, even if he has to pay all of the cost himself" (Olson 1965, 34)

The logic is reasonable. People with many resources, be they social or physical may have an interest in investing substantially in the common pool resource and the group. This way they can profit as individuals, while benefits to the group is a bonus. On the other hand there are many studies of incidents where heterogeneity is interpreted as one of the root causes for negative development and poor performance. One example is a study from India (Aggarwal 2000) where cooperative efforts of maintenance on community-owned wells is described as failing, partly due to cultural and economic heterogeneity. Bardhan and Dayton-Johnson (2007) point to several studies in indicating the same to be the case for joint irrigation. This makes heterogeneity and homogeneity worth looking into as grounds for speculation and potential explanations for the results of the case studies in this thesis.

When thinking about the topic after a discussion about institutions it appears, however, that people of diverse backgrounds will bring with them a varied "backpack" of rules to the table of cooperation. The effects of this are up for speculation, and I have no illusions about finding an answer at this point. Dolšák and Ostrom (2003) points to the possibility of social capital and trust as the keys rather than the homogeneity or heterogeneity. A group of appropriators trusting each other they claim, are more likely to restrain their use of the common pool-resource and comply with agreed-upon limits. In my eyes this seems reasonable in relation to

homogeneity, as it is not farfetched to assume homogenous groups (e.g. groups from same village) trust each other more than groups characterised by various forms of heterogeneity.

White (1993) say identifying social boundaries is the crucial task when analysing institutions and looking at the degree of homogeneity. If the group is divided by boundaries where people on different sides “play by different rules” we can assume that this in some way affects the group dynamic. In the two case studies of this thesis, then, identifying boundaries of this type within the groups of appropriators will be important. Doing this is, however, not an easy task:

“To recognize a boundary is not an innocent activity (...). Boundaries are subtle and complex results of action (...). Social organization is like some impacted, mineralized goo, some amazing swirl of local nuclei and long strands of order among disorder. In possible boundaries it is rich indeed (...)” (White 1993, 127).

Further he adds that when groups agree upon these boundaries and gives them explicit attention resulting in action; this is a sign of emergence of new institutions as a way of balancing and “levelling” the social field. The concepts of heterogeneity and homogeneity together with the notion of boundaries can prove fruitful as analytical tools when describing the institutional realities constituting the cases of study in this thesis.

3.5 Can institutions be designed?

So far the debate in this chapter has circled around *institutions* and other terms related to studying these. We have come to an understanding of institutions as *rules*. Rules, we have seen, must be understood broadly and encompass many different phenomena. I have argued that institutions in many ways shape human action and interaction, while leaving room for choice. If the argument is valid, being able to design institutions for management of common pool resources would be one of the most valued assets for NGO's, national governments, regional bodies of governance and others who has an interest in how natural resources are utilised throughout the globe. Creating institutions that favour desired social outcomes is indeed an alluring idea. Tragedies of the commons could become relics of the past. I now explore literature that has dealt with this issue; the possibility of *institutional design*.

Nemarundwe and Kozanayi (2003) claim most literature on common pool resource management over the last years has focused on getting the institutional setup “right”. In other words; fix the institutions - solve the common pool resource dilemmas. This, they argue, has justified *piecemeal institutional engineering*; a praxis where external agencies enter

communities, set up committees and other governance structures with little concern for existing institutional arrangements. Mandondo (1997) researched the governance of forests in Tanzania. He claims to see a dualism between external organisations "rationality" (science) and "irrationality" (tradition) of local people. This conflict leaves donors wanting "hands-on" control of operations, often resulting in praxis similar to what Nemarundwe and Kozanayi (2003) describes. Mandondo's research leaves him recommending the opposite;

"The findings of this study are, thus, not amenable to policy recommendations within frameworks that recognize a duality between the rational and irrational in people's actions and beliefs. A policy recommendation (...) is to leave local people to their own designs regardless of the rationality or irrationality of their actions and beliefs." (Mandondo 1997, 365)

Dolšak and Ostrom (2003) warn about difficulties involved in designing common pool resource-institutions. They note external funders often operate on a time-frame much shorter than is required for adaptive development of successful institutions. Further they point out:

"When common-property regimes are initiated with external donors' funding, a danger exists that the devised rules will not correspond to the social customs, norms and value-orientations of those on whom they are imposed" (Dolšak and Ostrom 2003, 19)

In the example above designed institutions cross-cuts local reality causing unintended consequences. Goodin (1996) contemplate the complexity involved in social processes and concludes that institutional designers are non-existing *mythical* figures. Institutions, he claims, can come about by three means; accident, evolution, and intention. In the latter he finds room for *attempted* institutional design, but highlights:

"...there is no single design or designer. There are just lots of localized attempts at partial designs cutting across one another. Thus, even within the realm of our intentional interventions, what we should be aiming at is not the design of institutions directly. Rather, we should be aiming at designing schemes for designing institutions – schemes which will pay due regard to the multiplicity of designers and to the inevitably cross-cutting intentional interventions in the design process" (Goodin 1996, 28).

Klijn and Koppenjan (2006) similarly note institutional blueprints are always introduced in specific social contexts and this affects the way actual institutional rules-in-use will look:

"...after all, formal rules are not identical to the institutional rules-in-use(...) Formal decisions may, in the short term, break down institutional practices, liquidate organizations, establish new ones, adjust resources, change common outlooks and so forth. But that does not mean that a new institutional practice will immediately be established. Even if a fairly comprehensive institutional blueprint is introduced, in practice

these new institutional rules will have to be interpreted, accepted, applied and internalized." (Klijn and Koppenjan 2006, 156)

Meahger (2004) relates this to the notion of legitimacy. Rules of governance, he claims, needs legitimacy in the context where their introduction is intended. They must be legitimate both in origin and application. This means they must be consistent with some set of prevalent social norms about governance, process application or honesty. Thus agents designing institutions in his eyes are required to look at and understand the local sub-text of laws and existing institutions prior to their efforts.

Despite many warnings, the idea of manipulating existing institutions or designing all-new ones holds too great potential gain to be abandoned all-together. The idea suggests that we may be able to induce pro-social behaviour and maintain social order at low cost (Bicchieri 2006). In cases like those studied in this thesis, the idea of designing institutions that fosters cooperation sounds tempting. The philosopher Cristina Bicchieri (2006) shares many of the warnings listed above. She goes on; however, to defend the possibility of structuring environments to produce desirable behaviour. In other words design of institutions *is* possible, but difficult.

Similar conclusions are drawn by many others. Most scholars appear to align themselves with the warnings of taking local reality seriously. Hobley (1996) shows how several projects where decentralisation of decision-making about natural resources by transfer of institutional power to locals at village-level has failed. She attributes this to lack of knowledge about the situation *on the ground*. On the topic of forest management she states: "*Without a correct understanding and clear identification of the client group it is unlikely that local forest management will be sustained over the long term*" (Hobley 1996, 24)

Alexander (2005) writes for an audience of planners, people often involved in institutional design. He joins the chorus underlining importance of knowledge about the locale in which one is working, blaming most past failure on hasty decisions on behalf of external agents:

"To be effective actors, planners must understand something about institutions in general, and know their specific institutional contexts in particular. Until recently, planning theory and education have contributed little to this end" (Alexander 2005, 210)

We have previously examined what Ostrom (1990; 2005) calls a set of institutional design-principles. Given the success of governance regimes utilising these principles it could be tempting craft specific rules based solitarily on these. Anderies et al. (2004) notes that this is not necessarily a good idea. Although these principles, these characteristics, are often observed in long-enduring common pool resource governance systems, they note that they have not always come about through deliberate *design* as the name may imply, but rather through what Goodin (1996) would call evolution or accident. Ostrom (2005) discourages people from making blueprints based on the principles - nor, she adds, are they specific rules, but underlying principles, traits found *in* rules on which particular rules shaped to fit the specific local context can be built. As far as the prospects for designing and implementing (successful) institutions she has no easy answer and notes in a no-nonsense way: "*It depends*" (Ostrom 2005, 258)³⁹.

³⁹ Skjølsvold (2008) have scrutinised the cases studied in this thesis with particular attention given to institutional design. He argues that the poor performance of the common pool resources in part must be interpreted as a result of flawed institutional design.

4. ANALYSIS

4.1 An institutional analysis of two cases – a borehole and an irrigation system.

Over a significant number of pages I have now clarified my understanding of various aspects of the institutional framework. Furthermore I have raised the topic of common pool resources and problems associated with their governance. Through the linkage of these concepts; *institutions* and *common pool resources* I hope to have established that the theory is a suitable tool for the analysis I am about to embark on. In the following I apply the institutional framework to two empirical cases located in the central region of Kasungu, Malawi.

Several challenges are involved. Identifying different actors, their positions, and their roles are part of this. The decision-process related to the use of the common pool resources must be visualised as must the institutional backdrop that empower rule makers, decision makers and sanctioning bodies. Further the institutions have to become clearly visible to the reader, both formal institutions like laws and informal institutions like norms. The role of history in shaping these institutions needs to be accounted for as must the distinction between institutions and organisations. Both cases have considerable involvement of external actors. It is also my intention to address how these have succeeded or failed as institutional designers.

4.2 The borehole

Of the two cases in this study, the borehole appears most successful in terms of preserving physical structure and providing continued access to water for the appropriators. According to records kept by the borehole committee it provided 80 households with access to clean water in the month of July, 2007. Official logs as well as an inscription on the concrete floor around the hole indicate it was *sunk* on the 4th of December 2001, making the structure approximately five and a half years in the fieldwork period⁴⁰. In broad historic terms this can hardly be described as a long-enduring system. As a resource, an organisation and a social system it has, however, provided enough action to create a very interesting case of study.

⁴⁰ When asked about when the borehole was constructed answers varied greatly among respondents. While some knew the exact year others answered as varied as 1999 on one extreme to 2005 on the other. This might point to one of the issues raised in the methodological chapter; respondents do not want to appear ignorant and answers “something” even if they do not know the correct answer. See chapter 2.2.1 for a discussion on this phenomenon. Another possibility is that some respondents speak of other boreholes.

4.2.1 Context and history

To appreciate how the institutions of the borehole came into existence we need to gain at least a partial understanding of the power-structures and institutional reality of the area it provides with water. First it is important, and this is relevant for both cases of study, to understand what is meant by a *village*. Europeans usually refer to villages as being geographical locations, units that without complication can be pinpointed at maps. Thus Merriam-Webster's online dictionary defines a village as: "*a small assemblage of houses in the country, less than a city, less than a town*" (Merriam-Webster 2008).

This definition poorly fits Malawian reality. It is true that villages here too are located in the country. The difference lies in *villages* having social rather than physical boundaries. Looking at a cluster of houses with European eyes we could conclude that this is *one* village, while the households observed in fact belong to three or four different villages. People in one village are often related to one another and the importance of family, clan or lineage must be underlined. When describing mundane life this poses several challenges, particularly when speaking of location. For example I will be talking about the borehole as being "*located in the village*". Given the fluid definition of villages as social entities it can be objected that this way of describing *where* the borehole is will give an insufficient account of village-life reality⁴¹. When saying that the borehole is located in a specific village, then, I refer to the village in control of and regulating use of the borehole. In an institutional-theoretical line of thought this means the village where the borehole is *located* define how parts of the institutional structure look. This is especially true for formal institutions, like laws, referred to by Scott (2001) as being in the regulatory pillar of institutions.

Another element needed to grasp the social and institutional reality of the area is the division between people who are involved in economic activity labelled *trading*, and people who do not take part in this. Close to the village of the borehole there is a *trading centre*. This is seen as developed in the sense that it is bursting of economic activity. Many people make a living there by selling crops, self-produced goods, or other items obtained through various means.

⁴¹ A potent illustration of this was provided via the household located closest to the borehole, 3-4 meters away. It does not see itself as part of the village where the borehole is "located", but as part of another village.

Many people indulging in *trade* do not originate in the area. Some have migrated from the south, others from the north⁴². This is, as we shall see later of some importance. At this point, however, I only want to note that there is, in the minds of people a distinct division between people who are “traders” and people who are “true villagers”⁴³. The latter do not, at least to the same extent as the former participate in this economic activity but are self-sustained. Several respondents were, however, living in the “true village” *and* involved in the business-community. It is therefore, without further explicit investigation, hard to say if there is an *actual* qualitative difference in how the groups sustain themselves. The division does, however, regardless of its material substantiality produce very *real* differences in behaviour and beliefs about the behaviour of others⁴⁴.

One interpretation is that this has to do with how people define and construct their realities and “lifestyles”; either as traditional or modern and progressive. Some see the western, “developed” way of business and economics as highly desirable; wanting to be seen as modern, while others want the traditional lifestyle of a village. One respondent fluent in English had moved from a “true village” to an “urban” residential area. When explaining this move he was explicit:

“The village life is a tough life, you know? You struggle to survive and there is very little you can do to improve your situation. I did not associate with that life anymore, so I moved here and built this place. You can’t be *modern* in the village” (“Trader” respondent)

Note that also traders or businessmen are organised in social villages similar to “true villages”. The *trader villages* and *true villages* in the area were, however, under the jurisdiction of different group village headmen, and for people living in the trader villages the traditional hierarchy functioned more or less like a bureaucracy as we know it in the west⁴⁵. The difference was further underlined by the group village headman of the trader villages

⁴² Mtika (2007) notes how *circular labour migration*, for a long time has been a major social force, shaping contemporary Malawian society.

⁴³ The word “trader” was used by “villagers” as a name for those who made a living through commercial trading. It was, however, a negatively charged word. Many respondents reported not trusting *the traders*. The people involved in this commercial activity preferred to be called “businessmen”.

⁴⁴ This reminds us of the legendary effect described by Thomas and Thomas (1928) later to be known as the Thomas theorem: “*If men define situations as real they are real in their consequences*” (Thomas and Thomas 1928, 572).

⁴⁵ The traditional hierarchy of Malawi looks like this: The *village headman* has jurisdiction of one village. Above him is a *Group Village Headman, chief of a cluster of villages*. At the top local level is the *Traditional Authority*, chief of an area in a region. Malawi had 250 Traditional Authorities as of 2002 (Benson et al. 2002)

nickname; *the mayor*⁴⁶. The most important thing to note about the dichotomy of the groups is that they both see the *other* as being different from itself. Thus both groups re-create and enforce the division by treating each other differently on a day-to-day basis. White (1993) stressed the importance of recognising social boundaries in institutional analysis. The social boundary identified above in very real ways affects governance and institutional reality of the borehole.

4.2.2 Institutional history

We remember that the borehole was sunk in December, 2001. Its history does not, however, start at this date. The need for more boreholes in the area was first recognised by the local community around 1993-1994. Many respondents related this to the rise of multi-party democracy in Malawi and the general feeling of optimism that followed. It is difficult to speculate in retrospect on why people acted like they did. One interpretation given by some respondents is that shift from one-party dictatorship to multiparty democracy was driving force, enabling people to take a more active part in "developing" their immediate surroundings. This interpretation is similar to one provided by Mwalubunju (2007) who claims activity in the Malawian civil society mushroomed due to the new political scenery.

At that time only one borehole existed in the area, located at a health centre nearby. The population was increasing rapidly and the borehole could not cater for everyone. As a common pool resource it had reached its limit and the appropriators were facing the classic problem of overuse (see e.g. Dietz et al. 2002 or Ostrom and Gardner 1993). Too many people were sharing a scarce resource, only available from this pool. Breakdowns occurred frequently and long queues were normal. The situation was not ideal in terms of hygiene; people feared outbreaks of cholera and other diseases. For these reasons many obtained water from other, less safe sources like old private wells.

Between 1995 and 1999 applications were sent from the community to the Malawi Social Action Fund to have four new boreholes drilled. I should note, however, that the people of the village where the borehole is located today had little or nothing to do with this process⁴⁷. The

⁴⁶ While the other group village headmen used this term to taunt him, giving him less credibility as a chief, he saw it as an honour to be addressed this way.

⁴⁷ I refer you to chapter 4.1.1 for a discussion on villages and what I mean when speaking of the borehole as "located in a village".

applications were accepted, but no more than three places physically suitable for drilling boreholes could be found.

What do I mean when I say people of the village where the borehole is located today did not take part in the application-process? First we must note that when the boreholes were constructed the village I speak of was not yet formally recognised by the traditional authority. Recognition of a village holds great prestige, and with it comes power, status and legal rights related to land and property. Thus when I say the people of the village where the borehole is today had nothing to do with the application this is only a partial truth. The fact is that at that time, this village – at least officially – did not exist, and the borehole-site was part of the “trading area villages”, under the jurisdiction of the previously mentioned *mayor*⁴⁸. People living there were seen as traders. Thus, the social dichotomy of *traders* and *true villagers* was not seen as cause for concern prior to designing resource-management institutions.

When sinking the borehole, the Malawi Social Action Fund made a few demands, placing some restrictions on the local community. A contribution of bricks and sand for construction was expected. The *mayor* was in charge of organising both sand-collection and manufacturing bricks. Most respondents described this as a collective endeavour involving the entire community. Thus for the first time participants and future appropriators of the borehole faced a social dilemma of the type described in chapter 3. The option of not contributing and still reaping future benefits of safe and accessible water was there. This is a prime example of a possible free-rider problem as described by Dietz et al. (2002).

To overcome the dilemma the Malawi Social Action Fund made sure people knew there would be no borehole if the community failed at its task. This, in addition to the area’s history of water-problems provided strong incentives for participation. A combination of external pressure and the thrill of finally getting safe water made coordination of this effort a simple task for the mayor.

Additionally the Malawi Social Action Fund had strong preferences for the layout of borehole governance-structures. Demands were made that easily fit the category *institutional design*

⁴⁸ The distinction between before and after legal recognition of the village is not as strong in the eyes of people from this village as it is for traders. In their eyes the village had *de facto* existed prior to this point, but with certain limitations.

(See chapter 3.4). First the democratic election of a "borehole committee" was ordered⁴⁹. The committee was to consist of appropriators, and have more female than male members. A plausible explanation for the demands is the Malawi Social Action Fund's awareness about the *social dilemmas* they would create through construction of the borehole. The establishment of a committee can be seen as a deliberate attempt at "changing the rules"; applying what Kollock (1998) labels a structural solution to the dilemma. Further the community was informed that the government would not *under any circumstances* return with additional funding. Thus money to keep the structure intact had to be raised by the community, preferably organised by the newly elected committee. In light of Ostrom's third design principle for long enduring institutions of collective-choice arrangements (1990; 1993; 2005) the establishment of this committee seem wise. Appropriators elected a group of peers with responsibility of crafting the rules governing the borehole.

Further the Malawi Social Action Fund organised a one-time training of two locals to do maintenance if needed⁵⁰. These steps ended the government-efforts in institutional design. Their choices, however, would prove to affect the way the boreholes institutional reality look today in more substantial ways. By coincidence the choice of *location* for this particular borehole was to play a vital part in the institutional development.

In 2001 experts from the Malawian government found a location perfectly suited to host a borehole. Personally I lay no claim at competence in the natural science the decision rests on. What is clear, however, is that the choice of location was entirely out of the locals' hands, done solely by government staff. While this sites physicality provided excellent conditions for a borehole, the social dimension of the space it would occupy was given little consideration by the experts. The location constituted an important element in the areas future power-structure, found in the middle of a corn field owned by the man who would later become recognised as village headman in a *true village*, pledging allegiance to a different group village headman than the mayor. I return to this shortly, but first continue my account of the institutional history of the borehole.

⁴⁹ The election was carried out under supervision by officials from the Malawi Social Action Fund. The votes were cast through raising hands, thus it was not secret. It is therefore not unthinkable that the presence of political figures like *the mayor* could influence the results of the vote.

⁵⁰ The people trained for this task were both members of what would later be known as the trader village

The first thing done post-election by the committee was to establish a set of rules. To avoid breakdown and cater for maintenance-needs it decided everyone should pay a monthly fee of 10 Malawi Kwacha (MK) to be legitimate appropriators. This fee was later raised to 20 MK. There was no other punishment for non-compliance but the social stigma inflicted by free riding⁵¹. Most respondents expressed that this system worked fairly well and that levels of free-riding were low.

As a sanitary measure laundry of clothes next to the borehole was prohibited. For the same reason children were not allowed to play at the site. Violations of these rules were to result in monetary fines. None of the respondents spoken to knew of incidents where this had happened. Neither was it seen as a problem. A reasonable suggestion is that normative pressure similar to what prevented free riding also made people abstain from these activities. The visibility of the activities made monitoring simple. Rules restricting the use of water for purposes other than drinking were also crafted. Examples of restriction-bound activities included drawing water for brick moulding or other business-purposes like beer-brewing. Finally there were rules for organisation of the boreholes cleaning. Teams were created and rotated on a weekly basis so everyone knew who had skipped work if the site remained dirty. Monitoring was collective done by the appropriators on a daily basis. This is another example of a wise decision in light of Ostrom's design principles for long enduring institutions (1990; 1993; 2005). In her fourth principle she claims self-monitoring is a trait displayed by most successful long-enduring institutional systems.

During the first two or three years the committee and system encountered no substantial difficulties. The setup seemed to sustain itself. Appropriators paid the fee and when breakdowns occurred the needed repairs were done. Free riding was no major issue, and the problem of provision was under control. Most respondents reported general satisfaction with cleanliness and quality of the hole in this period. At a certain point in time, however, perhaps as excitement and enthusiasm over clean water faded, there was a change of mood with some appropriators. One family living near the borehole was especially vocal in their discontent

⁵¹ None the less this is an institutional statement that can be described with the AD/CO-syntax (see chapter 3.1.2 for a discussion), thus being classified as a "rule" that can be formulated: All villagers wanting to draw water must pay 20 MK or else other people will think badly of them. The rule would be placed in-between what Scott (2001) calls the regulative pillar and the normative pillar of institutions. It is a formalized rule, but its sanctions are based on the general pre-existing structure of norms.

with the current management. This was the family of a man claiming chieftaincy of his own village exactly where the borehole is located, the man whose property surrounds the borehole.

4.2.3 A Clash of Institutions – traditional institutions “beat” modern institutions

Institutions can be slow moving. They are (to a degree) stable entities, structuring human action and interaction⁵². They manifest in many ways; camouflaged as nature in human minds (Douglas 1986) or as formal rules in books of law (see e.g. Ostrom 2005). It may sound like an oxymoron that these analytical units could somehow *clash* into each other like male rhinos fighting over territory. This, however, is what happened around the borehole. In the following I account for this *clash* before I show how one set of institutions triumphed over another, and how this has affected the institutional setup as it looks today. Finally I look at the effects of this on the borehole as a common pool resource and speculate on its future development.

As we have seen there is a clear social difference between *true villages* and villages associated with the business-community. None the less they are confined by the same traditional hierarchy of power. Bound by the same traditional authority they operate on the same institutional playing field. In the eyes of the law they have the same rights and obligations. We have come to learn, however, that institutions comprise more than what is written in the book of law, and off record the traditional authority seems to favour villages of the *true* kind.

2006 would prove an important year for the boreholes development. In June of that year a ceremony marking the official recognition of the new chieftaincy took place. The village headman pledged allegiance to another group village headman than *the mayor* and in doing so he defined his village as socially outside the trading community.

His accusations towards the old committee intensified. The people of his newly recognised village supported accusations about corruption and squandering of money. Demands were made that control of the borehole should be transferred from the borehole committee to a new committee, consisting exclusively of people from the true village. The borehole was in this village, it was claimed, and thus it should be governed by people from it. The mayor or the

⁵² I am aware of the inaccuracy of this statement. I refer you to chapter 3 for a thorough discussion on how institutions can be seen as structuring behavior, but also enabling individual choice.

committee had no intention of abandoning control, and as this became clear the *clash* of competing institutions commenced⁵³.

On one side you had the relatively newly designed institutions of the Malawi Social Action Fund. They had evolved into a system of rules, monitoring and sanctions, existing in its own right beyond the organisation that initially demanded its creation. It was durable in the sense that it had survived over several years. It was, however, a novice compared to its adversary; the traditional system of governance upon which Malawian society has rested for centuries.

The conflict between the newly recognised chief and the power-structure of the business-community with the *mayor* in charge was brought before the traditional court led by the traditional authority⁵⁴. It ruled in favour of the new chief and his demands. The committee stepped down and the impression left among many respondents was that money had indeed been squandered. The assumptions of difference between the two groups of appropriators were thus confirmed⁵⁵. The beliefs held by *true villagers* about the (low) trustworthiness of traders were strengthened while businesspeople received confirmation of the villagers' backwardness, fear of progress, democracy and other values they themselves claim to identify with. At this point we reach the situation today. In what follows I look at how the common pool resource-regime is set up and how institutions can be seen as affecting this.

4.2.4 The resource today – “ownership”

Let us begin with the basics of who “owns” the resource. The Malawi Social Action Funds intention was that the borehole should be a resource for the entire *community*. The “ownership” – at least in terms of being the authority in control of the resource was to be

⁵³ This illustrates Dolšak and Ostroms point (2003, 19) that there is a danger of external agents initiating common property regimes with devised rules not corresponding to social customs, norms and value-orientations of those on whom they are imposed. Had the Malawi Social Action Fund known the area better chances are they could have foreseen this conflict based on location of the borehole. Although not yet recognised in the eyes of the traditional authority this man was *de facto* a chief and a powerful figure.

⁵⁴ The clash I have spoken of may seem like a mere theoretic construction at this point. It is important to note, however, that control of the water-resource is highly sought after and that the clash had very real, physical consequences. The chairman of the old borehole committee, for example, described a situation in which the new true chief sent his “boys” to give him a severe beating at night while he was sleeping.

⁵⁵ A strong institutional statement for the *true villagers* is observed here. Formulated as Ostrom's (2005) AD/CO-syntax prescribed it can be stated: “Do not trust the traders, or else they will cheat you out of what you entrust them”. This is, however, a rule that is deeply vested in people's minds; it is a *fact of nature* as far as the villagers are concerned. Thus we observe with what Douglas (1986) describes as the most powerful, difficult to spot and hard to break down of institutions; an institution “hiding” as nature or part of natural order. This rule can be placed under what Scott (2001) would label *the cultural-cognitive pillar of institutions*.

anchored in the community via an elected committee. This rule is, as we remember, in accordance with Ostrom's (2005) third design principle of long-enduring institutions. What was to constitute the boundaries of the community was, however, not made explicit.

As the new chief became legally recognised the situation changed. He dismantled the elected committee, and in their place he selected a new group of people to assume their duties and responsibilities. Instead of being an elected body this group exclusively comprised people of the chief's closest family. The number of people in the group was reduced from 10 to 4. In many ways the chief now assumed the role of institutional designer. Ostrom (2005) noted that in cases when local elites are empowered at collective-choice level one can primarily expect policies that benefit them. In this village the chief and his family certainly fits the description of a "local elite".

In the appropriators' eyes, especially the group who see themselves as *traders*, Ostrom's predictions (2005) came true. The fact that all committee-members were now members of the chief's family undermined their legitimacy. Meahger (2004) notes that implemented systems require legitimacy in both origin and application to be successful. In this example a large group of appropriators saw its origin as *illegitimate*. Several respondents in this category expressed concerns about the chief treating the borehole as if it were his own *personal property*. In this there also lay strong criticism of the way the chief and his family handled money collected from appropriators to carry out maintenance-work and pay for other expenses generated by the borehole. Again the critics claimed that community-assets were treated as personal property. Strong criticism like this was far less frequent in the group of respondents from the *true village*, but was not entirely absent.

4.2.6 The resource today – use, regulation and violations

The boreholes resource is obviously water. It is not obvious; however, that use of this resource is limited to suppression of thirst. Several other purposes of use were identified, each with a set of specific regulations.

Two broad categories of appropriators can be distinguished. The first group uses water for *private consumption* the other for *commercial purposes*. Both categories are regulated by a set of institutional statements; some strictly formal rules, others more informal norms and internalised codes of conduct. In other words aspects of all institutional pillars spoken of by

Scott (2001) are observed. In most cases a mixture of formality and informality is observed. They have in common that they can all be described using the AD/CO-syntax as developed by Ostrom (2005).

Under the header of private consumption we find ordinary day-to-day use of water to cater for immediate needs. This includes drinking, washing clothes, cooking, and washing the body. This is allowed for anyone who pays a monthly fee of 30 MK. According to the committee these fees were collected to cover expenses related to maintenance of the site. In other words it can be seen as an explicit way of avoiding the problem of provision (see Ostrom and Gardner 1993 for description).

The appropriators doubted the official story. The chief was heavily criticised for treating the borehole as personal property. Many saw the payments not as an investment in the future welfare of the borehole, but as payment directly to the chief and his family for them to spend at their own leisure. There were many indications of substantial *free-riding* by appropriators. First there was considerable discrepancy between the numbers of users stated in two different official written sources⁵⁶. Further most respondents reported far more users than the official records of paying appropriators do. Third were several explicit stories of people hoarding water at night-time when they would not be seen. Both groups of respondents – *traders* and *true villagers* thought the share of free-riders were largest among traders. One interpretation is that faced with the social dilemma (payment vs. non-payment), the (perceived) knowledge of the committees embezzlement and the perception of villagers as backward is enough to give many actors incentives to violate the formal rules of the common pool resource. If this interpretation is correct institutional statements at the cultural-cognitive level (Scott 2001) are stronger than those of the regulative pillar. The illegitimacy of the leaders in the traders' eyes adds thrust to the explanation.

The family in-charge was aware of the problem. To avoid night-time activities they had installed a lock. People living around the borehole did not see this as working, however, as they could still observe people indulging in the same activity after the instalment of the lock. Difficulty of exclusion is one of the key characteristics of common pool resources (See e.g.

⁵⁶ The records of the treasurer stated 80 paying users while a borehole mechanic had noted a total of 70 appropriators.

Ostrom 1990; Ostrom et al. 1994; Dietz et al. 2002; Dolšák and Ostrom 2002; and Ostrom 2005). This particular borehole is no exception⁵⁷.

Non-compliance was punished two ways. First, you would be chased from the site if caught drawing water without prior payment. If this did not cause correction of future behaviour the perpetrator would be brought before the chief and he would "*talk them into senses and set them straight*". These punishments may seem low. My impression, however, is that all though free riding did occur the possibility of this punishment was what kept most people paying. Many explained how fear of the chief and his family led them to pay even if they were not certain the money was spent as intended. When confronted with the social dilemma in its purity; asked if they would pay in the absence of monitoring most people answered truthfully that no; they would not.

Responsible for monitoring activities around the borehole (both appropriation and payment) were the closest family of the chief. Ostrom's fourth design principle of long-enduring common pool resource-institutions says that the appropriators or someone accountable to the group should be in charge of this (Ostrom, 2005). The chief's family are appropriators, but are still better viewed as an authority in the tradition of a *leviathan*, using fear as their main tool for making clients abide the rules.

In addition to rules for payment there were regulations to avoid people washing their clothes at the site. This was explained as being a sanitary measurement, initially recommended by the Malawi Social Action Fund. A similar rule was also enforced by the previous committee. There had been a few incidents where this rule had been violated. Respondents explained how people understood and respected the rule because of the relationship between clean water and personal health. In this case it appears norms located in what Scott (2001) would call the cultural-cognitive pillar of institutions and the "laws" of the borehole (regulative pillar) point the same way. Thus breaking the rule becomes almost inconceivable. There is a social dilemma present here (See e.g. Kollock 1998 or Ostrom 2005) and it is solved by a

⁵⁷ This is not the only way difficulty of exclusion is visible as a problem. At the beginning of every month the woman in-charge of collecting money has to be present at the borehole from dusk till dawn for three consecutive days. This is costly in both time and energy. Appropriators can, however, without much effort avoid drawing water in this period. Guarding the borehole 24/7 all-year through is not a realistic alternative, neither are more high-tech solutions. Thus the problem of exclusion is indeed a real, hard felt problem. Monitoring of the borehole in the rest of the month appears to have been a rather arbitrary activity. Thus being caught "stealing" or not was most of the time a matter left in the hands of chance.

combination of institutional statements all guiding behaviour the same way, while being seen as legitimate by all appropriators. Someone might easily save energy washing clothes at the site rather than carrying the water back home. This is the egoistic assumption, the rawest edition of *homo economicus*. This must be weighed against the possibility of a disease infecting the entire community as a result of a contaminated water-source. The punishments for non-compliance were similar to those mentioned earlier. There were no monetary fines, but fear of what the chief and his family might say and the general negative talk the action would generate. In addition washing clothes is both time-consuming and highly visible, making monitoring of other appropriators compliance with this rule constant by the entire group.

Intuitively we could think the need for formulating similar explicit rules in regards to washing of one's body next to the borehole would be necessary. This was not seen as an issue by the respondents. I interpret this as an example of an institutional statement being deeply internalised by the group. Showering in public next to the borehole is something you "just don't do", regardless of the possible benefits. One of the respondents described a situation in which a man who had not paid the monthly fee snuck up to the borehole at midnight to draw water. He was interrupted in the middle of a bath and the social humiliation he endured must have been enough to ward off other potential mid-night bathers. The respondent described him as a "*madman*", clearly indicating the extraordinary nature of his actions. Again, this is an example of human organisation beating the social dilemma. In this case, however, no other rules than the ones deeply embedded in the minds of people were needed.

As far as drinking and cooking is concerned no regulations exist. A plausible interpretation is that these activities are spatially removed from the borehole, thus being without influence on future quality of the borehole as a common pool resource. This was, however, what most appropriators; both *traders* and *true villagers* primarily used water for.

The other overarching type of use can be classified as water used for *commercial purposes*. Here appropriators explicitly intend to profit from withdrawal of water. Two different uses of this kind were identified. The first was water for brewing beer; the other was water to be used in the process of moulding bricks. In these cases we must distinguish written and explicit rules from actual praxis. For brewing beer there were no conflicting reports. Both people in

the true village and traders reported having to pay an additional fee of 50 MK in order to be able to withdraw water for this purpose.

Both brewers of beer and the general public saw this as a just rule. These appropriators used large quantities of water and their activity regularly created long queues. There were, however, no sanctions available if the rule was violated. The beer-brewers were well known in the community, and one interpretation is that the pressure for these people to obey that rule was substantial. Records indicate this fee indeed being paid by several people, *true villagers* and *traders*.

The other form of commercial use was a more sensitive issue, namely using water for moulding bricks. This was permitted if an extra fee of 200 MK was paid. Bricks, however, are not always commodities. Some people mould bricks to build a new house, some want to expand their present house, some want to build for the rental market and some just sell bricks. Thus, telling who is a professional "brick maker" is not as easy as recognising the local beer brewer. These possibilities of hiding in the mass makes the incentive-structure look different than for beer-brewers and the risk of being caught free-riding is smaller.

Further, brick moulding was one of the situations activating the social boundary between *traders* and *true villagers* causing substantial differences in the rules for each group. The formal rule was clear; all appropriators engaging in this activity had to pay the fee. In reality the true villagers did not have to pay, while traders did. In other words the *attributes* – the "A" of Ostroms ADICO-syntax (Ostrom 2005) are different in the formal institutional statement than they are in the informal⁵⁸. The latter overrides the first. This was an additional element boosting trader distrust towards the family in-charge. In addition to causing further distrust in relation to the borehole it magnifies and confirms the already established beliefs caused by the social boundary. Table 1 shows the distinction between the use of the common pool resource for private consumption and commercial purposes with various regulations.

⁵⁸ For the formal rule the institutional statement is: "All people (A) wanting to draw water for moulding bricks (I) must pay an extra monthly fee of 200 MK (D/C) or else he/she will not be allowed to draw water for this purpose in the future (O)". The rule in-use, however, has this institutional statement: "All *traders* (A) wanting to draw water for moulding bricks (I) must pay an extra monthly fee of 200 MK (D/C) or else he/she will not be allowed to draw water for this purpose in the future(O)"

Private consumption		Commercial purpose	
Use	Regulation	Use	Regulation
Drinking	Allowed for anyone paying a fee of 30 MK	Brewing beer	Allowed for everyone against an additional monthly fee of 50 MK
Washing clothes	Allowed for anyone paying a fee of 30 MK. Clothes must not be washed at the borehole site	Moulding Bricks	Allowed for everyone against an additional monthly fee of 150-200 MK. Regulation applies only for <i>traders</i> .
Cooking	Allowed for anyone paying a fee of 30 MK		
Washing the body	Allowed for anyone paying a fee of 30 MK. Not allowed at site, regulated by norms.		

Table 1: Different uses of water and its regulations

4.2.7 The appropriators

Over the past paragraphs I have looked at uses and regulations of the borehole. This has provided some hints as to how the composition of the appropriator-group may influence the common pool resource-outcome. In what follows I examine more closely the characteristics of this group before I speculate on how this may affect the resource. First we need to grasp who the appropriators of this common pool resource are. There are no limitations as to who they *might* be. Certain physical traits, however, limit who can use it and who can't. The first notable aspect is in line with above observations about *traders* and *villagers*. As appropriators they represent two different groups. In other words the group of appropriators is no socially homogenous group. One of the groups clearly possesses more power in regards to the borehole; the *true villagers* are dominant. On the other hand, economically and materially the *traders* are more privileged.

From the image I sketch it may seem like there are two different, but homogenous groups of appropriators. It must be stressed that this is not entirely true. The *true villagers* make up the most homogenous group. An important division in their case is closeness (not geographical, but closeness in kin) to the chief. This is important both for gaining influence and for access to material wealth. One of the most sought after resources in the village is fertiliser, and chiefs are in charge of distributing government-subsidized fertilizer coupons to their "clients". Out of the 15 households receiving fertilizer in this village at least 10 was closely related to the

chief. Thus, in terms of wealth and power there are also real differences within the group of *true villagers*.

The *trader*-group is even less homogenous than the *true villagers*. In many ways the one thing unifying and making them a *group* is the very fact that they see themselves as not being villagers. They come from many parts of the country, from different tribes and from varying backgrounds. One respondent, a man fluent in English and previous committee-chairman expressed his concerns about the composition of traders like this:

"The problem around here is that there are too many different people. Some form the north, some from the centre and some from the south. It is all mixed here. They have their own cultures and ideas that they bring here (...). They come from different places, different tribes; they have their own ideas on how things should be." (Previous head of borehole committee)

In terms of economic wealth there were also great differences within the group. Some owned literally *nothing* while others were relatively wealthy. All in all it is clear that the appropriators are not a homogenous group. The separation in two groups represents what White (1993) calls a social *boundary*. This particular social boundary is very visible, and under the surface many less visible boundaries may exist. Whether or not this has a positive or negative effect on the commons-outcome is not entirely clear. Many of the observations above, however, hint at negative effect in terms of creating and adding to conflict rather than building cooperation. So far this has not caused severe degradation or destruction of the resource. When asked what would happen if the borehole broke down in the near future most *traders* and many *true villagers* responded this would mark the end of the borehole.

White (1993) sees agreement upon boundaries as a sign of the emergence of institutions "balancing" and controlling outcomes of social situations. In this case there is agreement on both sides of the social boundary's existence, but no agreement on how this boundary is to play a part in the management and division of power in relation to the borehole. Today it partly defines who can affect the resource-governance while giving the current regime and institutional set-up little trust and legitimacy with appropriators on the wrong side. Thus

different people play by different rules. In the long run distrust and conflict in governance of common pool resources blends poorly with ideas of sustainability⁵⁹.

4.2.8 Summary

The story about institutions surrounding the borehole is a history of conflict, especially on the administrative level of what we can call the borehole organisation. The *clash* between the designed institutions and the traditional institutions can be interpreted in different ways. One way is to see it simply as a struggle between various fractions of power for control over a resource. Another is that the conflict expresses a deeper cleavage between modernism and tradition in a rapidly changing Malawian countryside. I find a mixture of these to be a plausible explanation. Especially important is the omission of the distinction between the two groups when the Malawi Social Action Fund planned and implemented the new institutional set-up. Under other circumstances the social boundary may not have manifested as a conflict over the resource.

Today the rules are monitored and sanctioned arbitrarily and there are signs of discrimination against people on the wrong side. *Traders* are more frequently sanctioned for breaking rules and are forced to make larger investments than *true villagers* for using the borehole commercially. Thus the rules, as they look today lack legitimacy, both in origin and application.

The difference in treatment of appropriators has led to distrust in people on top of the governance-structure. Many explicitly said they would free-ride had they not feared the family in-charge. It is hard to say whether or not the family in-charge actually saved collected money for future repairs. If they did, no system of record-keeping existed. Many respondents expressed that if they could change one thing about the borehole management, *transparency* and *accountability* would be introduced. Further a majority of respondents clearly said a breakdown of the borehole followed by discovery of money-shortage in the chief's family would result in permanent closure of the borehole. A collapse of the borehole would make the water-situation in the area worse than ever as people would crowd to other boreholes already seeing many of the same problems. An alternative is turning to the river or wells for water, both considerably less safe than a borehole.

⁵⁹ Bjørnstad (2008) examines the cases studied in this thesis with particular focus on trust and trustworthiness, explaining the difficulties involved at least in part as results of the lack of this.

4.3 The irrigation scheme

The irrigation scheme shares many of the boreholes characteristics. An important difference is that degradation to a point of collapse has been experienced over the past two years. During the fieldwork-period the system was not in use. As with the borehole history is of great importance for understanding the irrigation scheme and its failure. In fact the following discussion will be of almost exclusively historic character since there is no *today* in this system.

4.3.1 History and context

It is not entirely clear when irrigation farming began in the locale where this system was later set up. What is clear is that up until 2001-2002 there was no distinct organisation present. The irrigation at the site was an individual effort rather than collective group-work. Around that time (2001-2002) individual irrigation farming had become relatively successful. The Catholic Development Commission in Malawi, an NGO involved in aid, sent representatives to talk with the entrepreneurs and see their work. They acknowledged the success and soon established the local rivers potential as a site where many could irrigate land and crops.

Therefore the Catholic Development Commission of Malawi decided to start a *project* in this area. Their development work is based on a philosophy or theory called *LISTEN*. This header offers two things; an organisational structure and an institutional framework for local communities to manage resources. Thus the establishment of the irrigation system by this NGO is best viewed as a pure effort of institutional design. In conversations officials from the organisation repeatedly stressed how the initiative for these types of projects had to come *from below*, from the communities themselves. Respondents in the local community contested this. People explained how the organisations arrival had come as a surprise to both Village Headmen and ordinary people with no prior contact between the parts. Talks with chiefs were initiated and the NGO suggested organising a group to manage a new system of irrigation. In the following I examine the institutions as designed by the Catholic Development Commission of Malawi and how they clashed with institutions from another agent of development and local institutions.

As mentioned it is not entirely clear who initiated individual irrigation efforts. Some of the people involved at early stages are, however, known. One is a group village headman leading a cluster of villages close to the local river. Thus when the NGO arrived (regardless of who

approached whom) this powerful man would play a central role in how future reality of the system would look.

After a series of meetings between local chiefs and the Catholic Development Commission of Malawi it was decided that the *irrigation project* as envisioned by the latter part would become reality. In what followed it is not entirely clear who decided what. Most respondents claim that the organisation *instructed* the locals while a few respondents say they were *advised*⁶⁰. For us the important thing to recognise is that its role as an institutional designer was very active, much more so than the government in the borehole case.

When describing the *LISTEN* setup we must first note the involvement of more than one village in the project. From start there were seven villages involved. Not all were under the jurisdiction of the same Group Village Headman. In addition to members from these villages a few lived scattered in the nearby trading-centre. This means the distinct dichotomy of *traders* and *true villagers* observed in the borehole-case was not present to the same extent. Instead there are several groups, several potential social boundaries to be explored. I return to this at a later stage and speculate on how this may have affected the outcome.

The Catholic Development Commission of Malawi began their efforts by explaining how people of different villages could organise in separate clubs or groups. These should be linked by a central organ, an *irrigation committee*. As with the borehole, members of this committee were elected democratically and made accountable to the other appropriators. Anyone could be a committee-member with two exceptions; chiefs and their relatives⁶¹. An elected committee of appropriators is consistent with Ostrom's (2005) third design principle for long-enduring common pool resource institutions. Preventing chiefs and chief's family from being involved also seems wise in light of the same author's insight on how local elites often shape policies to cater for their own needs (Ostrom, 2005).

⁶⁰ It is hard to say whether or not this is a result of inconsistency in the work of different interpreters or if it is actually a qualitative difference in what respondents wanted to get across.

⁶¹ Chiefs were described by respondents as "untouchable". If they or their family committed a foul it was difficult to have them punished. This can be seen as an example of institutions in what Scott (2001) called the regulative pillar (the Malawian book of law) as being "overruled" by institutions (rules) more deeply imbedded in people's minds. As we have seen examples of in the past, attributes of the two institutional statements differ (See Ostrom 2005). Chiefs are just not punished, that is only *natural*. To avoid situations like this the Catholic Development Commission demanded to not have them in governing positions.

The irrigation committee had three main responsibilities; crafting rules, monitoring the rules and sanctioning non-compliance with the rules. Further a second committee, an overseer or audit-committee was installed. This committee was known as the *LISTEN-Committee*. Its task was to oversee and monitor all activity in the irrigation project. In cases where irregularities were discovered its mandate was to resolve the problem. *How* it should do this was unclear⁶². If failing at its task it could report to the Catholic Development Commission of Malawi who could send its representatives in attempts to resolve the situation.

This was not all. What was set up was an elaborate system both in terms of social complexity and physical size. Maintaining the structures would require economic input. Rather than providing funds the NGO provided 8 pigs and 60 chickens. This was seen as assets that would help the group provide essentials like money and fertiliser to ensure future welfare of the system. The pigs and poultry were organised in two clubs with their own committees. The *LISTEN-Committees* responsibilities also covered these clubs. In order to raise more funds people had to pay a fee when they became members. Another measure was the collection of a monthly fee from each household. All these initiatives can be seen as steps to avoid the problem of provision and ensure future maintenance and sustainability (see e.g. Ostrom and Gardner 1993).

Figure 4 shows a stylised image of the organisational structure and institutional setup of an *irrigation project* as imagined by the Catholic Development Commission of Malawi⁶³. Documents from the organisation indicate that this setup can be seen as a *blueprint* used in several similar systems in Malawi. It should soon become apparent, however, that designing working institutions is not a simple task. The system was not created in a social vacuum and other institutions soon proved important also here

⁶² The day-to-day monitoring and sanctioning of violations against the rules were performed by the *irrigation committee*. Thus the *LISTEN-Committee* had no real power to enforce any sanctions other than reporting to the Catholic Development Commission of Malawi

⁶³ For the sake of symmetry the figure has 6 village-level clubs instead of seven.

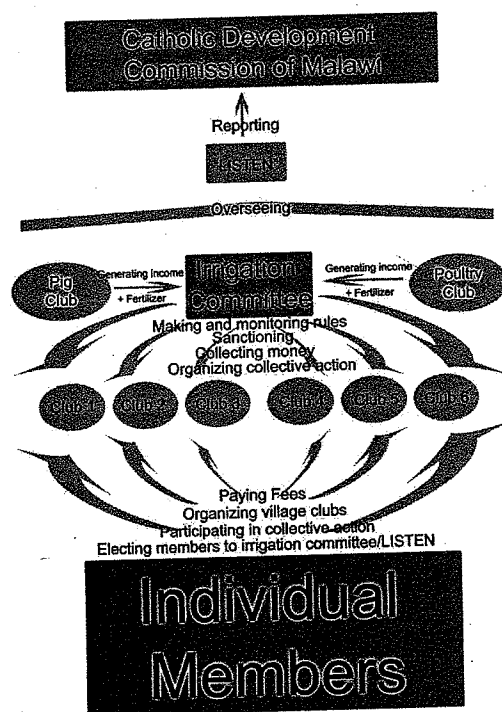


Fig 4: Institutional and organizational framework for an irrigation system as designed by the Catholic Development Commission of Malawi

and being on the *right* side of social boundaries. People from the villages of those owning the pumps were allowed to borrow them free of charge or at worst rent at a substantially lower cost than the case was for people living in other villages. Similar praxis was reported for labour. People lucky enough to know these individuals could get the needed help to operate the pumps free of charge.

This market was not in any way regulated. The irrigation committee, the LISTEN-Committee, or the Catholic Development Commission of Malawi had no way of intervening and I suspect its rise may have caught them by surprise. In many ways farming was still an

⁶⁴ The treadle-pumps are highly labour-intensive and require several strong individuals to be operated. Thus both labour and equipment could now be rented out.

In terms of equipment the group had few or no available resources. The irrigation canal was hand-dug and maintained by the group prior to the farming season. The group had no pumps and were reliant on some of the wealthy figures in the community who personally owned treadle-pumps to benefit substantially from the new system. This had two major consequences. First it created a new rental and labour-market for the owners of pumps⁶⁴. They felt allowing others to benefit from their personal property without making at least a little profit would be wrong. Secondly it made explicit the importance of social capital

individual effort, but more organised. As far as collective action goes the challenges were maintaining the canal and preparing the land⁶⁵. Regardless of the systems inequalities the first year or two were relatively successful. Many respondents reported increased access to food in this period, keeping hunger at a distance. Some was disappointed in the level of monetary profit, but all in all the impression is that of a positive start.

4.3.2 Three is a crowd

In the first case studied, the borehole, a considerable degree of tension was observed when externally designed institutions met the institutions already in-place. The irrigation project tried to counter this by prohibiting recruitment of local elites to governing bodies. These restrictions were, however, to prove of little use. After a time of few problems the committee faced a series of accusations. Since the projects beginning the group had managed to agree on a parcel of land that was to produce crops the group could sell for its mutual benefit. This was an addition to the pigs and chicken, the money generated was intended for fertiliser, seeds and other necessities. This land (or rather the crops on it) was to be what sparked conflicts that eventually lead to collapse of the entire social system.

The first accusation the irrigation committee faced was selling these crops and embezzling the surplus funds. Indeed the committee, after substantial pressure from the community, admitted to this crime⁶⁶. What followed was a series of events resulting in a takeover of the irrigation-governance by the traditional institutions. It started as the irrigation committee stepped down and a new committee was elected. The election was supervised by the Catholic Development Commission of Malawi and the standards of the first election were followed. The woman elected treasurer, however, was a very old lady. It soon became clear that she could not perform her duties and a decision to replace her was made. This process unfolded without the interference of any outside organisation. The woman chosen to replace the treasurer is not just

⁶⁵ It should be noted that the land was not *owned* by the participant in the irrigation system. He/she had the rights of use; for one season at a time, and for the purpose of irrigation-farming only. This means that you did not necessarily farm the same plot of land over two consecutive seasons. The preparation of land was done *before* the plots were divided – something I interpret as an effort to avoid free-riding. Preparing the land after division of plots would remove the benefits of the collective action, leaving each participant to his/her own.

⁶⁶ This is a situation where the *social dilemma* as described by e.g. Kollock (1998) is extremely explicit. Only a few people face this particular dilemma, namely those in the systems committee. Their defection, however, is more hard felt than the case would be if one appropriator appropriates beyond the devised rules of a common pool resource. Here a few people have the chance of seizing the group's assets, thus making a hefty personal profit while wreaking havoc upon the financial situation of the collective. That being said, the evidence towards the committee seems scarce. Accusations, it seems, does not have to be true to have a devastating impact on power. Douglas (1986) asserts that accusations are frequently used to balance and control the use of power.

any woman, but the wife of the areas Group Village Headman. Now the system faced a clear violation of the rules as designed by the Catholic Development Commission of Malawi. Many respondents expressed how they were afraid of doing something; challenging the group village headman's wife indirectly meant challenging the group village headman. Thus they expected the *LISTEN*-Committee to rectify the situation. It did no such thing. At this point in the story people were shocked to learn that this woman; the wife of the group village headman, was also a member of the *LISTEN*-Committee⁶⁷. In other words she was also responsible for reporting her own violation of the rules to the Catholic Development Commission of Malawi. Again there is a significant discrepancy between the direction of the formal institutions and the institutions that actually appear to influence on human behaviour⁶⁸.

Little happened at first, but a feeling of discontent spread amongst the members. After a while the other irrigation-committee members started retiring without giving any reason. Rumours about drunkard behaviour and laziness spread in the community, especially about the committee's chairman. As the others he eventually stepped down and the *second in command*, the treasurer seized his seat as the group's new leader. As in the borehole-case traditional institutions had effectively out-trumped a designed framework of institutions.

The shrinkage in the irrigation committee persisted, and as expected the *LISTEN*-Committee did not intervene. At the same time the Malawian government gained an interest in the project. They decided to assist as an agent of development and their contributions were massive compared to the resources available to the group and the general wealth of the appropriators. They provided around 500 000 MK and an engine-driven pump to irrigate more effectively⁶⁹. The new economic reality gave the group new challenges. Meanwhile the

⁶⁷ It is unclear how this could have happened, and how the Catholic Development Commission of Malawi could fail to react. The fact that this discovery came as a surprise to most members might point to the *LISTEN*-committee not being very active. Although this is based much on speculation it could hint at this particular organ being reality only "on-paper" rather than a real functioning committee, thus underlining the difficulties involved in designing institutions and making them work as was intended in real social settings.

⁶⁸ The cultural-cognitive norms of chiefs as un-punishable override the rules crafted by the Catholic Development Commission of Malawi. Many respondents expressed having similar views on the wife of a group village headman. One respondent described it as being "foolish" to think that someone in the chief's family could be punished "like an ordinary person".

⁶⁹ The participants of the public goods games (see chapter five) were asked to fill out a short questionnaire under the guidance of an interpreter. One question was: "How long would it take you to earn MK 1000". Out of 75 answers the average was 15, 6 days. This number may be flawed in many ways, but clearly illustrates the magnitude of 500 000 MK is in this region.

Catholic Development Commission of Malawi was very unhappy with the situation⁷⁰. Apart from money the government brought little. They offered advice on how to use the engine, trained two people in engine-operation and demanded the money kept in a bank account.

In addition to this they gave some advice on how to do the actual farming. Again there is a discrepancy in the way people answered. Some say the government *instructed* them while others say they were *advised*⁷¹. Some of this advice contradicted earlier advice from the Catholic Development Commission of Malawi. This made the latter agency pull out making the *LISTEN*-Committee lose whatever credibility it had left⁷². From there the Catholic Development Commission was exclusively involved in the pig- and chicken-clubs, but had nothing to do with irrigation.

This can also be seen as an example of institutional *clash*, but on a different level than seen earlier. The Malawian government and the Catholic Development Commission of Malawi clearly had divergent ideologies and ideas about how an area is best developed. While the latter emphasised slowly building sustainable institutions the first stressed the importance of equipment and cash. In this case the cash and equipment-approach was introduced in a system that was already crumbling; traditional institutions and chieftaincy were gaining full control of the operation. Ostrom's (2005) warnings about local elites shaping policies to fit their own agenda would again prove prophetic.

4.3.3 A story of collapse in one season

Despite the committees crumbling, people were excited about the government's entry and the prospects of irrigating land by the not-so labour-consuming method of pumping water with an engine. Thus the group of appropriators was record-high with more than 80 households involved at the start of this season. One should perhaps think that a group of this size would escape the problems of provision and allocation (see e.g. Ostrom and Gardner 1993) by

⁷⁰ Officials from the organisation explained how they did not like the way the Malawian government acted in situations like this, and that their "takeover" of development-projects was a general pattern. According to one they just "*rush in with cash and equipment and do nothing to back it up*". He explained how their strategy was to move in on relatively successful schemes, "pump them up", and if successful take the credit.

⁷¹ Again this might be a methodological issue tied to the use of interpreters, but may also indicate a very real difference in how people perceive the role of these outsiders.

⁷² Local officials claimed they had never pulled out of the project, that they were still present and that the project was still *theirs*. People involved in the farming clearly stated, however, that the Catholic Development Commission of Malawi was long gone. They were, however, still involved in the chicken-group (The pigs had all died of swine-fever), a group that at this point had little or nothing to do with the irrigation, but was, and is, a separate organisation all together.

collecting fees to cater for future needs of maintenance. This was, however, an instance where the group did not manage to overcome the social dilemma.

Once the government-money arrived a decision to remove all fees on membership was made. The appropriators applied pressure on the people in-charge, claiming that if money were collected in addition to the government-funds; it would guarantee embezzlement on part of the leaders⁷³. Thus the group now had pool of money and no guaranteed future income. We remember that *sustainability* is in part determined by the resources replenishment rate (Kollock 1998). In this system replenishment depended on funds, maintenance and fuel, giving cause for concern before any irrigation was done with the engine.

Before farming could commence some things needed to be done in terms of collective action. The land needed preparation. This was, as in earlier seasons, done prior to dividing the plots. Farmers did not know where they would be farming, leaving the responsibility of all land to the entire group. In this period of preparation the leaders had a set of rules that they demanded appropriators should follow. Every member had to be present at every work-day. The workdays, as decided by the same leaders were Monday, Wednesday and Friday. Late arrival was punished with a 50 MK fine. Failure to attend an entire day's work was fined 100 MK. Enforcement of these rules were fairly arbitrary. People in villages close to the river and close to the group village headman's wife were punished less frequently than other members. While some respondents indicated not knowing anyone punished for this, others could point to 10-15 incidents⁷⁴. Failing to attend three consecutive days would result in dismissal from the scheme. This sanction had never been activated, even though the leaders claimed they had considered it at a few occasions. This implies that there was a degree of free-riding involved in the process of land preparation, but that the problems were not considered serious enough to justify the eviction of members. Collectively organising work involving members of 80 households is a task that implies considerable risk of free riding. The implementation of these rules represents an attempt at solving these issues through structural means (see Kollock 1998).

⁷³ Even though we have seen that chiefs are untouchable as far as the law goes, they are social actors and not beyond all form of sanction. They to seemed vulnerable to rumors and gossip, something that may have influenced the decision to strip the project of membership fees.

⁷⁴ This may be an indication of a social boundary within the project separating people close to power (and the resource) from people further away, assigning them different values that may result in different treatment when non-compliance to rules are detected.

One more effort was needed before irrigation could commence. Maintenance and repairs of the canal was an annual task due to its construction of mud. Prior to this season the canal was strengthened with cement in head and tail-end, the remainder needed re-building with mud and plastic paper. This was done post land-division, giving each member responsibility for making ready the part of the canal passing by her plot. This makes free riding difficult. There is no mass to blend into; non-compliance is visible to all other appropriators. The social pressure this creates is probably stronger than the case is for land preparation. Nonetheless the same monetary fines were found here. No instances of fines given for this offence were identified, something that may hint at it as being a minimal problem

Post plot-division canal work has the potential of causing another problem. One characteristic of irrigation common-pool resources is the *problem of asymmetry*, a result of head enders and tail enders different positions (Ostrom and Gardner 1993). Given the egoistic assumptions of *homo economicus* (Elster 1989) people in the tail end are less likely to be assisted by others. People in the head end will have their fields irrigated whether tail-enders do their job or not, while tail-enders depend on work done by others. As a possible counter-measure plots were divided so that members of the same village-level clubs had plots next to each other. Thus people with close relations to each other were also "canal neighbours". If this boosts levels of cooperation it could be used in support of a hypothesis favouring homogeneity of groups in management of common pool resources. This is, however, purely speculative. Regardless of which factors most heavily influenced the behaviour of people, the work was done and the canal ready when the season started.

In what follows I look at how the first season of engine-based irrigation farming unfolded. Let us begin by examining how the *local* power structure, as it was present before any NGO or government entered the scene affected different subsets of appropriators. Members of the scheme came from seven different villages. This means that by most means it is not a very homogenous group. The borehole case visualised a cleavage between two distinct groups of appropriators, a feature that at a first glance is missing here.

Under detailed scrutiny, however, a similar dichotomy is revealed. The family of the group village headman had now secured the position of treasurer through his wife. Due to the retirement of other committee members she *de-facto* functioned as a leader. At the same time her sister in-law and closest neighbour had assumed the position of secretary. It was widely

recognized among respondents that this duo was where the power of the irrigation-system was vested. Most respondents also acknowledged the group village headman's influence on the state of affairs through these two. This may not have caused significant problems had it not been for the fact that he only had jurisdiction over 4 out of the 7 villages involved. This was a difference in the institutional makeup of the villages, but was also a trait of the areas geography. While the villages under the mentioned group village headman were close to the river, the other villages were located further away from the resource.

This cleavage created results similar to those induced by the *trader/true villager* dichotomy of the borehole case. The social boundary became apparent in a number of ways. People living in the villages furthest away from the river felt they were systematically discriminated by the other members and leaders of the scheme. Most of them were *tail enders* and they recognised the problems this posed. On the other hand villagers closer to the river saw this as their legitimate right. After all it was *their* system, and people coming in from further away should be happy they benefitted at all. This feeling of discontent amongst the appropriators of *wrong kind* did not, however, materialise in any kind of action as long as all could apply the needed water to their fields.

In the borehole case relatively small amounts of money had created a substantial degree of conflict. The group of irrigators had been given a massive amount of money. The appropriators were suspicious about how the leaders would treat this capital, and in an attempt to assure people that everything was fine they had crafted rules about how they would manage the funds. First a rule about withdrawals from the bank; whenever this needed to be done at least three committee members had to go together; the chairman, the treasurer and the secretary. This did not ease the appropriators scepticism, especially the group of people from the villages furthest away. By now most committee members had joined their past chairman and abandoned their seats⁷⁵. Thus – rule or no rule – the secretary and treasurer always travelled to withdraw funds without companions. Their actions could not be monitored; they reported to no one and in the event that they committed a foul their chances of being punished were slim. The social dilemma they faced was real, indeed.

⁷⁵ The current leaders insisted that these people stepped down due to shame of character-flaws like alcoholism. Most respondents, including past committee-members credited the total domination of the treasurer and secretary as cause for their action.

Going to the bank in this area is not like making a quick stop at a corner-ATM downtown Oslo. The travel to and from the bank, as well as the process of withdrawing the money takes time. Sometimes an entire day would pass, and yet the leaders would come home empty-handed because they for example had failed to identify themselves. Thus the difficulties of interaction between the local community and the banking-system were not trivial. To make up for these efforts the government had instructed the irrigators that they should be compensated for whatever expenses they had on these trips. For example they were compensated for one meal. The money for these expenses was to come from the same pool of money that was given to the group by the government. This made the group of appropriators even more suspicious than they had been before. Many were claiming that the amounts received were too high, and the money went straight from the teller to their pocket rather than to the things they were intended for. After a few trips to the bank rumours of embezzlement started appearing. The social boundary separating people living in villages close to the leaders from those living at a distance again became apparent. People close to the leaders took their side, claiming nothing was wrong and that their leaders were doing a recommendable job. The others took the opposite stance. The leaders admitted in interviews that they were aware of the talk. At this point they could, however, live with it.

4.3.4 Farming with an engine for the first (and last?) time

Irrigation farming with an engine gave the group new challenges. In many the need for *collective action* was increased compared to the past when treadle pumps were used. One new challenge that surprised the group appeared in the canal. Its construction of mud and plastic-paper caused no problems when farming with treadle pumps. Switching on the engine for the first time, the farmers realised the water-pressure created was much stronger than the case was with treadle-pumps. The forces damaged and nearly destroyed the canal. Thus, maintenance would prove much more labour-intensive this year than the case had been before⁷⁶. This made the head ender/tail ender problem of asymmetry more visible, and strengthened the cleavage between the two groups of appropriators.

⁷⁶ This was also a point stressed by officials from the Catholic Development Commission of Malawi. They said that while the government brought tools they forgot that the villagers had little experience in using them. Without proper training they thus create more problems than they solve. Cement and bricks to strengthen the canal might, in the eyes of the Catholic Development Commission of Malawi have been a more appropriate place to start than an engine and 500 000 MK for fuel.

Meanwhile the engine was also a piece of machinery demanding much attention and maintenance. The Malawian government had trained two people especially for these tasks, two so-called *engine boys*. These were elected by the systems leaders, and came from a village close to the river. In other words they were both on the *right side* of the social boundary sketched above. Respondents from the *wrong* villages claimed the engine boys were reluctant to do work on the engines if problem occurred when they were irrigating. Many claimed they demanded small bribes to do the work, while there were no reports of such praxis from the respondents on the *right side*. One engine boy was needed just to start the engine. Thus if he decided not to come in the morning, no irrigation would take place.

There were several reports about this happening and on at least one occasion it caused a major quarrel that needed resolution by the Traditional Authority. One morning when villages of the *wrong kind* were to irrigate no engine boys showed up. No irrigation was possible, causing severe frustration. The following day, when a group of appropriators from the *right side* were supposed to irrigate they went to the site and demanded their rightful share of water applied to their plots. They were met with refusal and following quarrel led to a halt in irrigation for days. At this point many were fed up. They were, however, able to resume irrigation after having the dispute settled by the Traditional Authority.

People were irritated, blaming each other, the leaders, the group village headman, the government and even the Catholic Development Commission of Malawi for the situation. Much time was spent on meetings in which accusations were made in many directions. In the middle of this, as levels of tension were already high, the two solitary leaders of the system had to make a difficult announcement: they had run out of both fuel and money. People, especially those on the *wrong side* were furious. They demanded to see records, receipt-books and transcripts from the bank. The leaders were then forced to make another admission; they had removed the funds from the banking-system quite some time ago, and were managing the funds from their own homes. This, they explained, was needed due to the problems associated with visits to the bank⁷⁷.

⁷⁷ As we have seen these problems are indeed of non-trivial character. None the less, the rules from the government were explicit in that funds should be kept in a bank-account. Again we see an example of how different institutional statements point in different directions, and in the end traditional statements vesting power in the family of a group village headman prevails. Since it is very difficult to punish these individuals, they run a minimal risk in violating the rules, other than of being thought negatively of by the community.

Having no fuel, no money and no income there was no other choice than to shut down the engine. Crops started withering and many respondents reported great losses because of the incident. Two weeks later parts of the crops were fortunately saved as the region experienced rain extraordinarily. After harvesting, two villages directly pulled out of the project completely and many individuals followed their example on personal initiative. It is difficult to say whether or not the people in-charge of the scheme had embezzled funds or if the government contribution was not substantial enough to fund one season of farming. Most respondents, however, both from the *right* and *wrong* villages were in no doubt that foul play had indeed taken place.

4.3.5 The grim prospects of a new season

Several hints have been made about the season described above being the last season of the system. The conflicts are obvious reasons for this, but other factors are also relevant. Without government funds raising money to farm with the engine will be difficult. As a new season approached the leaders acknowledged that there would be no farming if they did not generate cash soon. Each of the remaining participants was asked to contribute 2000 MK. The members refused, and even more people decided they would not irrigate this year, regardless of how the scheme developed. The size of the required sum combined with the fresh memory of 500 000 MK disappearing did not provide the needed incentives for farmers to continue in the project.

Between 10 and 20 members had expressed a desire to continue in the project. Most respondents were, however, under the impression that activities at the site would cease unless the government intervened. There was little hope of this happening. As of today the institutional framework designed under the *LISTEN* header is completely disabled and there is little to no trust in the current leadership. The canal is beyond recognition as a canal. The engines whereabouts is not known, but rumours had it was hidden with the leaders who were suspected of planning to keep it as private property when the noise had settled. During the period of fieldwork land preparations were long due and irrigation should have begun. No such activities were seen. Rumours circulated in the community that the systems breakdown would lead to a return of the Catholic Development Commission of Malawi. On at least two occasions these rumours were so explicit that they stated a date for when officials would come to the site. On these dates, however, nothing happened and it is speculate on the reliability of these rumours.

It appears as the institutions designed by competing agents of development and indigenous institutions have out-competed each other leaving only losers and dry land. Whether or not it is possible to build new and more sustainable institutions on the crumbles of this system or if the problems experienced by the appropriators have left irrigation an impossible task remains to be seen. Given most the financial situation of most people in this area, and the ever-looming threat of famine, the latter would be very unfortunate.

4.3.6 Summary

The story of institutions surrounding the irrigation system in many ways resembles that of the borehole case. Social boundaries that existed in the area long before irrigation was planned are activated when different groups have to wear the same institutional straightjacket. Thus the shiny *LISTEN*-header as depicted in figure 4 is re-stitched to the point of resembling a ragged cloth rather than a straightjacket. People in different positions use the same playing field, while the rules vary substantially between different sets of players. The conflict this causes is boosted by the disappearance of money and systematic discrimination. In the end collapse seems hard to avoid, and in my eyes this is an example of a real *tragedy* of a common pool resource.

Looking at the systems governance the final season while comparing with Ostrom's (1990; 1993; 2005) design-principles for long enduring common-pool resource institutions its collapse is not surprising. At least four out of seven principles were violated. First there was not *proportional equivalence between benefits and costs*. All appropriators contributed the same, while one group were systematically "better-off" as an end-result. Second *the collective choice arrangements* empowered the local elite rather than the group of appropriators. Third the same leaders were in charge of *monitoring*. Fourth and finally there was no rapid and low-cost access to conflict-resolution mechanisms, something that became clear when irrigation stopped for days over a conflict between two groups of appropriators.

5. PUBLIC GOODS GAMES

5.1 Playing Games

Over the last two chapters we have seen how an institutional framework can be used to tell the story of two common pool resource governance regimes. The data analysed has mainly been obtained through semi-structured interviews, conversations, and written documents⁷⁸.

As mentioned on several occasions time and energy was spent in the fieldwork-period playing a series of experimental *public goods games*. In the following I explain why this was done, how it was done, talk about the results and explain how this exercise can illuminate – or – further the understanding gained of the case-studies in an institutional framework. In writing about this my view is that theory, methodology, results and interpretation are so intertwined and distinctly separate from the rest of the thesis that it is best to keep all in one separate chapter. The chapter is structured as follows. I begin looking at what *games* and game theory is, linking the topic to sociological tradition and explaining how the games can be seen as a *third case*. Here I formulate two questions based on the cases already studied. These questions will not be entirely answered by the games, but my hope is they might shed new light on potential answers. Next I review specific methodological issues involved in playing games before I move on to results and interpretation of these⁷⁹.

5.2 Game theory and sociology

Since the 1980s game theory has become increasingly popular among sociologists (Swedberg 2001). This does not mean its application in our field is a recent innovation. Jessie Bernard wrote an enthusiastic article about the possibilities of game theory in the American journal of sociology in 1954. Since then many sociologists have applied the vocabulary, methodology or a combination in their work. Goffman used games as a general metaphor while notable sociologists like Boudon and Coleman have used it more actively (Swedberg 2001).

So what *is* game theory and how does it relate to the cases examined in this thesis? Petersen (1994, 498) states game theory is useful when "...studying *interdependent decisions where two or more actors act with intention*". In this thesis I have focused in part on situations of choice described as *social dilemmas* related to *common pool resources* (e.g. Kollock 1998;

⁷⁸ I refer you to chapter 2 for a thorough review of the methodology and data of these chapters.

⁷⁹ Many of the methodological issues are overlapping with problems and issues dealt with in chapter 2. In these cases I will refer you there.

Ostrom 2005). If we assume people in central Malawi act with intention (and I don't see how we can assume they *don't*) the leap of admitting games and game theory's usefulness in shedding light on *choice* in social dilemmas is short.

One of game theory's strengths is providing ability to outline situations of strategic action using precise and compact language⁸⁰ (Gezelius 2007). This appeals to scientific minds, but is not without downsides. Swedberg (2001) notes how sociologists often see little relationship between game theory and empirical reality. Gezelius (2007) adds that game theory achieves its mathematical precision and compact language by adopting much criticised assumptions of rational choice theory⁸¹. He goes on to say that this makes many sociologists refute the idea of games as contributing to understanding of the social world.

In the case of this thesis language will be less precise than Gezelius (2007) predicts, mainly because the games played were what Swedberg (2001) calls *low-tech* versions of games and game-theory. None-the less they simplify and crystallise the essential in situations of choice. Swedberg (2001) underlines that game theory has an intrinsic value, regardless of relationship to empirical reality. In this thesis I have not applied game-theory as a main theoretical thrust, but doing so would be possible. An analysis of appropriator's choices could be done with the language of game theory alone. In this thesis, the games played and the discussion around them could, in addition to providing fruitful data, come to serve as an additional theoretical way of seeing the empirical cases. I argue that there is a relationship between the games played and the empirical reality; data collected in the games strengthen findings of interviews and observations. Thus *results* and not only theory and language of games is useful here.

Swedberg (2001) adds that low-tech game theory is a particularly good tool for studying cooperation and coordination, often used to study social dilemmas. Similarly Camerer and Feher (2004) note how the use of common resources is one of the real-life phenomena most

⁸⁰ I would like to note that the word "social action" could replace "strategic action". Let me clarify. The difference lies in theoretical assumptions made beforehand about individuals and the ways individuals make decisions. *Strategic action* seems to assume methodological individualism. A "structural dupe" (Giddens 1984) can also be analyzed using the vocabulary of game theory, while her actions cannot be described as strategic.

⁸¹ As we have seen earlier when discussing rationality and choice in situations of social dilemma the "rational" of rational choice is highly debatable. I have argued that the institutional approach is one where classic sociologic assumptions of structure and social action can meet economic assumptions of rationality (and thus choice). Similarly I claim that the language and playing of games can be fruitful even if you are a non-subscriber to the assumptions of pure rational choice theory.

similar to the challenges participants face in *public goods games*. These are precisely the themes I have focused on applying the institutional framework so far.

5.3 Games as a third, experimental case

Over two chapters we have seen various institutions influencing governance of two common pool resources in Malawi. We have seen how institutions affect cooperation. *Cooperation* is an important element also in public goods games. More specifically it is the choice of being cooperative versus being non-cooperative that is central.

The game played is structured as follows. Five individuals are placed in a room. All are provided with 100 MK. Each individual have two envelopes; one *investment* envelope and one for personal money. Any amount between 0-100 MK can be invested. Whatever is not added to the investment envelope is theirs to keep. The money invested is collected by researchers before the sum of all five investments are added together and doubled. The resulting sum is divided in five equal shares; one for each participant. Two variants of the game were played; one where the process is repeated 5 times, another with 10 repetitions.

I will provide a more detailed account of the games briefly. For now and for theoretical purposes it is sufficient to emphasise that what we did was placing the players in a situation of choice. This was not just any choice; it was a *social dilemma* (e.g. Kollock 1998 or Ostrom 2005). Participants face situations where they can (a.) choose to invest most or all money. If this course of action is followed by all players they gain substantial money in every round. On the other hand they could choose to (b.) keep most or all money. If the others contribute say, *everything*, and you contribute say, *nothing*, 100 MK could be kept while one fifth of the 800 MK generated by the other investments is added to that. Thus you can make a hefty profit. If all do this, however, nothing will be gained - much like if everyone over-appropriates from a common pool resource or free-rides when common pool resources require maintenance⁸². This is typical for public goods games; every player is best off by contributing nothing, but contributions from all makes everyone better off (Camerer and Fehr, 2004).

⁸² Swedberg (2001) noted that Sociologists often find game theory and games too theoretical and removed from empirical reality to be of use. In this case the money one could make in five or ten rounds is substantial enough to argue that the game itself is a very real empirical setting where much is at stake for the participants.

There are obvious differences between "real reality" and the games, but the structure of the game resemble situations appropriators face in borehole and irrigation use and management. The game can be seen as a social system in itself, a system in which researchers attempt to design institutions. Rules are made and decisions have to be made within the confines of these. As we have seen, however, more factors influence behaviour than formal rules crafted by outsiders. Thus it is naïve to think we could isolate individuals in a game-reality vacuum. The question is; how would institutions of the outside world influence players in the games?

5.4 Questions for the games

With the previous paragraphs and impressions from the cases studied in mind I now formulate two questions for the games. The questions relate to two tendencies that seem central to both cases. First; in the cases it appears that cooperation is most easily achieved when people involved are from the same village or cluster of villages. In both cases social boundaries seem to foster conflict. The first question is thus:

- A) Will groups of people consisting exclusively of people from the same village achieve better results (as a group) than groups with people from mixed villages?

Another observation is that traditional institutions tied to chieftaincy have a tendency to interfere with the plans of institutional designers. Whether this affects the commons-outcome positively or negatively is hard to tell; in one case it works for now, in the other the system has collapsed, possibly in part because of this. My second question to the games is:

- B) Will groups with a strong presence of traditional leaders such as chiefs achieve better results as a group than groups with no presence of this kind?

The answers of these questions will be of relevance to both cases already examined. Not only will they add theoretical thrust to two central findings, they will provide a new arena in which one can observe whether or not this particular part of the regions institutional setup affects how people act. Cárdenas and Ostrom (2004) say people working with experimental methods traditionally downplays the importance of culture, beliefs, group identity, social context, and personal identity in designed experiments. They stress, however, that these factors are important in shaping the context in which the games are played and thus also influence participant behaviour (Cárdenas and Ostrom 2004). They add that this realisation became

stronger as scholars moved experiments from university "laboratories" to the field. For me, then, learning if institutions of this Malawian region affects the games, and if they do; how, will be enriching both for understanding the institutions and for making sense of the games.

5.5 Playing games – practicalities

For theoretical purposes I have already outlined how the game looked. In the following I will do a more thorough job in making visible how the games were played, what methodological challenges were met and how we tried to deal with these⁸³.

The first thing we needed to decide was who we would involve as participants in the games, when we were going to play, and how we were going to recruit participants. In chapter 4 I give considerable attention to a social boundary dividing *true villagers* from *traders*. This boundary was discovered relatively early in the period and we thus decided to use it as basis for our experiment. A decision was made to play three series of games; one with *true villagers*, one with *traders*, and finally a series where the players were mixed. This gives the games a theoretical and empirical thrust; resembling the situation around the borehole⁸⁴.

We knew at this point *who* we wanted in the games, but how to select them was a different question. Upon arriving in the village we were to study, the *true village* using the borehole, a first step was making a list of all households. This was a relatively straightforward task; we walked around with the chief mapping every household he considered belonging to his village, writing down information like names of those living there. Thus we had an official list of people from the village we could draw a sample from. In doing so we asked the village headman for assistance. We asked if he could organise delivering a message to every household in the village about a meeting on the games we would hold at the local school house. The household listing displayed 37 households in the village⁸⁵. We needed 20 players

⁸³ It should be noted that this was a first-experience for all researchers involved. As novices I have no illusions about perfection on our behalf. The reader should keep this in mind, while I attempt learning as many lessons as possible so future experimenters can know both mistakes and good choices made.

⁸⁴ Cárdenas and Ostrom (2004) say playing public goods games with groups who share access to common pool resources and face the same common pool (social) dilemma can lead to increased understanding of individual behaviour in collective action situations. It would strengthen this study if the same games were played with participants in the irrigation scheme. Constraints in resources (time and money) made us decide not to do this.

⁸⁵ During our stay we learned that the accuracy of the list was not good. Some people had moved, others claiming to belong to the village were not on the list. Conversations with other researchers experienced from rural Malawi led us to the discovery that household listings done with chiefs frequently do not match reality.

for the first set of games and were prepared to have a lottery at the meeting where as many as 17 could be eliminated. When the day of the meeting came, however, only 22 households were represented⁸⁶.

Thus we needed to eliminate two. Every household were instructed to write the name of the household head and the name of husband/wife on a piece of carbon paper, giving us a copy we could use for the lottery. The original was the participant's ticket. Twenty names were then drawn and the two who did not appear were asked to leave.

At this point we could begin thoroughly explaining the rules to the participants. A detailed text had been prepared in English and translated verbatim to Chichewa by Dr. Stanley Khaila from the University of Malawi⁸⁷. After this explanation people could ask questions. The process of communicating with the participants was, of course, one filled with problems of language and challenges of translation. I refer you to chapter two for a proper review of possible difficulties involved in the process of working with interpreters.

Once all participants understood the rules we were ready to play. Before the data is analysed a few notes about the locale where the games took place can be made. We were able to borrow a local school-house in afternoons as arena. The main classroom was filled with benches suitable for our intention and was thus chosen as venue for both games and meetings. The benches were combined benches and tables with a small "shelf" making hiding ones decision about investment possible. The intention behind the placement of the benches in the room was to make concealing ones decision about how much to invest as easy as possible.

Chiefs, it appears, have many motives for obscuring lists. Power-relations in the village, bonds and obligations to kin, and distribution of subsidized fertilizer by the government are three possible explanations.

⁸⁶ There are several different possibilities as to why the turnout was so low. It might have been that the chief did not let everyone know about the meeting. Some people claimed that turnout at meetings was generally low, and as this was the first in our series of games people had no way of knowing the possible gains involved. I suspect, however, that not all were told. During interviews concerning the cases-studies several respondents indicated not having heard about the meeting prior to the first series of games. Already at this point it appears that we as "institutional designers" were not making all the rules, but that the traditional, indigenous "rules of the game" were also playing a role. When finding respondents for the last two series of rounds we wanted more control over who was actually playing and we thus took measures to prevent the influence of chiefs over this particular choice. More on this shortly.

⁸⁷ I refer you to appendix 2 for the complete script of the game in English and Chichewa. This text is a slight modification of a script kindly made available by Abigail Barr.

Once the game started a researcher walked from one side of the room to the other handing out 100 MK intended for investment. When the investments were made by all participants the same route was taken to collect the investment-envelope. Once collected the researchers left the room for another room in a separate building where the money was doubled and re-distributed in equal shares to the five envelopes. After this process the researchers returned and took the same route handing out envelopes. It was emphasised that payoffs from the first round was the player's to keep. Centred in the room interpreters were present, making notes of what was said and how the group interacted⁸⁸. After each round earnings made were written down on the blackboard. Thus participants saw how the game developed; if they cooperated the number on the blackboard would rise while an increase in defection lowered the number. Figure 5 shows the placement of players in the room, the location of the interpreters and the route walked by the researchers to collect and hand out money.

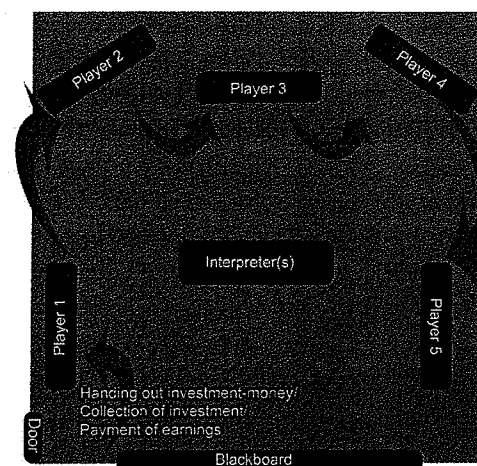


Fig 5: Placement of players and the researchers route in the classroom during public goods games

The first series of games were played early in our period of fieldwork, the second in the middle and the last towards the end. Let me make some notes on how we recruited participants for the last rounds. As far as *traders* were concerned we simply walked around the trader-villages, choosing 20 household at random. We did not choose houses located very close to each other in an attempt to keep the identities of the players hidden to each other prior to the game.

For the third round of games we needed 10 *true villagers* and 10 *traders*. We suspected that the chief of the true village had influenced our selection in the first round and wanted to avoid this. Similarly we wanted to avoid players knowing well-ahead who the other players were.

⁸⁸ This was done mainly to observe and identify what pressures (if any) participants lay on each other and if any participants were more active than others. This could potentially identify institutional and normative forces active in such a situation.

This was indeed a hard task, and it is hard to say if we succeeded. One of our interpreters volunteered for the task of finding 10 *true villagers* that had not yet played. He did this solitarily to avoid attracting attention. A similar approach was chosen for the *traders*.

5.6 The first series: *true villagers* play public goods games

The first set of games was played with *true villagers*. Four groups were established. The first two played five rounds; the last two played 10. The number of rounds was announced prior to the game. Let us begin with the *first game*. Worth mentioning about the first round of the first game is that players could not prepare for the task they were about to embark on. Thus they faced a different situation from what players of later games would experience.

Of similar importance is the makeup of players. One of the players was the village headman. When searching for ways traditional institutions (traditional *rules of the game* in society) affect our game, this seems to be a good point of departure. The chief was seated where figure 5 indicates "player 5". As the game was about to begin he made a brief statement in Chichewa. According to Dr. Stanley Khaila who was present and observing the game he simply uttered "*Tikolore!*" which roughly translates "*let's harvest!*" or "*We are here to harvest*". And harvest they did. Except from one instance in the first round all players invested the maximum amount, adding up to 500 MK. Figure 6 graphically displays how

much the *group* invested and earned in every round of the game.

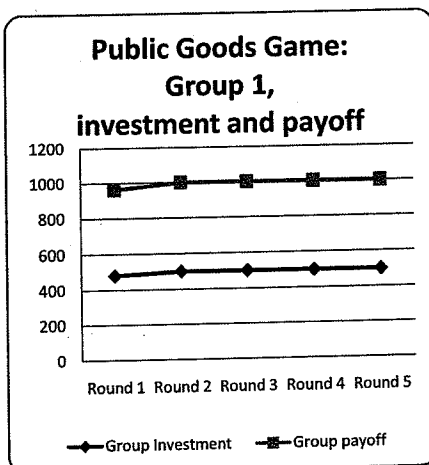


Fig 6: Group investment and payoff in group 1

There are several ways to interpret this. First it shows beyond any reasonable doubt that given the right circumstances coordination of action is possible in this village. I am fairly confident that the chief's presence affected the gameplay. The borehole case-study displays his power, many respondents are clearly afraid of him. Thus going against him, making the groups *harvest* less would constitute a considerable social cost. In-

between round number one and two, when one player contributed 80 MK rather than 100, the group discussed this using harsh words about the defectors future *suffering*. This is consistent with literature both on games and common pool resources. "*Cheap talk*" is found to be an effective sanction for non-compliance with rules and for alleviating problems in common pool utilisation (e.g. Ostrom, 1994). Camerer and Fehr (2004) add that in games like these allowing players to communicate during games drastically increases cooperation levels.

The next group was of a different character. There was a strong presence of people close to the chieftaincy, two of the chief's sisters played. One of them is the treasurer of the borehole committee; the other a respondent in relation to the irrigation system. Another feature of this group is that it consisted of women-only. Most important, perhaps, the group had time to prepare. While the first group went straight from being explained the rules to playing, the second group had 24 hours from being sent home until the game. Stopping these individuals from talking to each other would have been a massive task, one we did not embark on. Cardénas and Ostrom (2004) claims under circumstances where players are allowed to talk to

each other and agree on strategies people are likely to be able to retain a near perfect level of cooperation⁸⁹. They add that this depends on the entire group honouring the agreement. If violations occur, severe drop in investment-level is expected.

This appears to be exactly what happened here. In the first round all players invested 100 MK. From post-game interviews it is known that the group had agreed on this

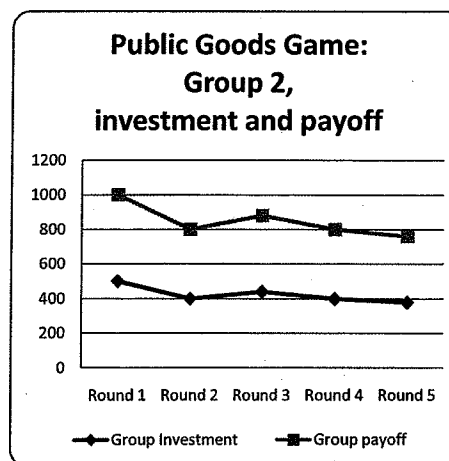


Fig 7: Group investment and payoff in group 2

strategy. The second round drastically altered the rules. Four out of five players invested 100 MK, while the last player kept 100 MK. The collective investment-levels plummeted, ending at record-low 380 MK in the fifth round. Here two players kept substantial amounts. Two

⁸⁹ In light of Camerer and Fehr's (2004) notes about the effects of communication *during* the games this comes as little surprise.

players stuck with the plan of investing 100MK all the way through while the three others contributed less. Figure 7 graphically displays how much the group contributed and how much the group received in payoffs. During the game the interpreters picked up an interesting piece of information. It became clear that the players saw the game as a *development game*, and they eventually interpreted "*development as having failed in this game*". This was interpreted as a result of individual greed in the group.

The third and fourth round of the game added another element, playing ten rounds. This doubles the number of choices to be made. The theoretical idea is to make decisions more *long-term*. The first of these groups had only female players. There was no presence of traditional leaders; no relatives of the chief. From post-game interviews it is known that also this group had agreed on a strategy of contributing 100 MK at each stage of the game.



Fig 8: Group investment and payoff in group 3

In the first round (round 3) all players did exactly this except for one player who decided to keep 20 MK. The other players reacted verbally between round one and two, claiming that the keeper of money had ruined the game for everyone. The *cheap talk* worked and from this moment everybody contributed 100 MK throughout the game. This confirms Cardenas and Ostrom's (2004) insight about near-perfect cooperation often being achieved under conditions when players are given a chance to plan strategies before the game. The agreement was violated once, as it was in group two. The difference seems to be that in this case only *some* money was kept while in the first case *everything* was kept⁹⁰. There is, it seems, (within this group) a tolerance for certain levels of defection. Keep *too much*, however, and levels of cooperation drop drastically like in group 2. Again, this is evidence

⁹⁰ Keep in mind that in the irrigation system, for example, people were still able to perform relatively well while accusing leaders of embezzling small amounts of cash. When it became clear that 500 000 MK had disappeared, however, the system immediately broke down.

that collective action can be coordinated in this village given the right circumstances. Figure 8 graphically displays the group's investment and payoff in every round of the game.

The *fourth* and final group of *true villagers* was the most diverse group. Three men and two women played. Two men were young while the last was an older character. In addition to being old he was an alcoholic. He had limited his substance-(ab)use for this event and was not very intoxicated, but he had undoubtedly consumed "*a few*" beers⁹¹. The women also differed greatly in age. One was very old, while the other was a young mother.

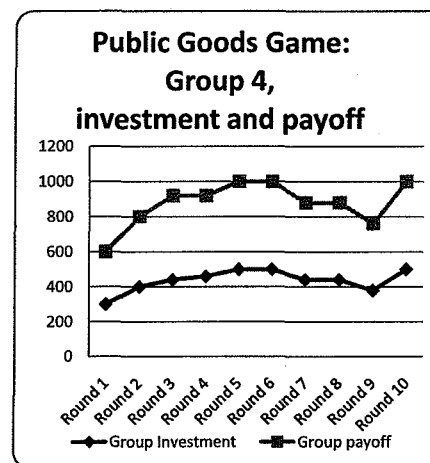


Fig 9: Group investment and payoff in group 4

Again, post-game interviews tell us this group had a strategy; contributing 100 MK in every round. In this game the agreement was broken with rigour in the first round. Two people kept the entire amount. Thus the collective investment was only 300 MK. Levels of investment sharply increased after this, but over 10 rounds the commitment to invest everything was only held by all participants 3 times. In fact, only two out of five players kept investing 100 MK, while all others kept various amounts at different stages of the game. Figure 9 graphically displays the group's investment and payoff in every round.

5.7 The second series: *traders* play public goods games

Conversations with *true villagers* revealed they thought *traders* would achieve superior results should they be given a chance to play the game. The argument was that traders knew how investments and "money-business" worked, enabling them to play the game better than

⁹¹ Alcoholism is a common phenomenon in this area. I made no systematic observation about peoples drinking-pattern, but it was apparent that a significant percentage of, especially the men, frequently indulged in heavy drinking. This is consistent with Kerr's (2005) observation from northern Malawi. She portrays the use of alcohol among men in the region as "excessive". Allowing a man who was slightly influenced by alcohol to play the game can be defended by the fact that he was under the influence of alcohol most of the time. When making decisions about use of common pool resources in *real life* he would most likely be in the same or more intoxicated state. Allowing this made the game closer to "real" reality and the empirical cases studied earlier.

themselves. Three series of four games were played. An attempt was made to make the groups fairly similar so that they could easily be compared. Thus the first group of *traders* resembled the first group of *true villagers*⁹². Two women and three men played. The oldest man came from a different trading village than the others.

The game was off to an interesting start with all players from the same trading-village investing 100 MK. The man from another village withheld 40 MK. This pattern was repeated in round two. The man from a different village kept 20 MK while the other players invested 100 MK. After two attempts without achieving perfect cooperation it appears the group had

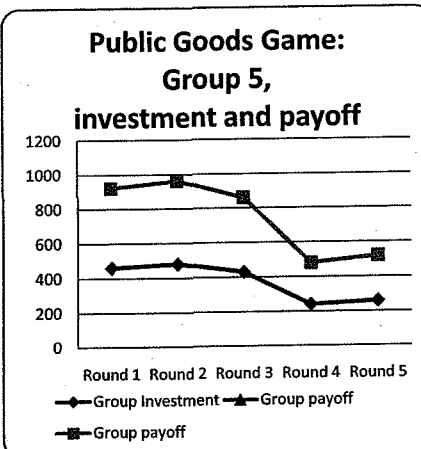


Fig 10: Group investment and payoff in group 5

The next game was played the following day. The group consisted of women-only. They were from two different trading villages; three from one, two from another. In the first two rounds all players invested 100 MK. In round three, one player deviated and kept 20 MK. The last two rounds saw another player keep first 20 MK and 60 MK in the final round. All in all, however, the game had high levels of investment.

⁹² Remember that also the trader-area is divided in social units called villages. In the games traders from different villages participated. Thus it will be interesting to see if this in any way influences the results. This division amongst traders in villages has been little explored earlier in the thesis and remains a topic future research could shed more light on.

enough. Levels of investment dropped dramatically. In round 4 on only 1 player invested 100 MK. The results are not easily interpreted. This was the first group of players, but in the second series of games. It would be naïve to think the players had not heard rumours about past games. Interviews show, however, that the rumours were not very accurate. One had heard stories about someone winning a bike; others claim to have heard nothing. A strategy was not planned before they arrived. Figure 10 graphically displays how much the group invested and how much it received in payoffs.

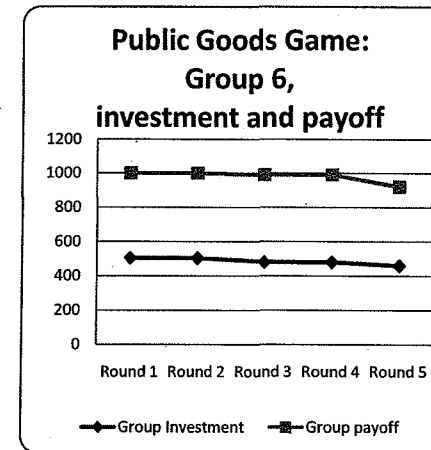


Fig 11: Group investment and payoff in group 6

the two men was a village headman for a trader-village. There were three trading-villages involved in the game. The two men were from the same village. The game began with all five players investing 100 MK. What followed was interesting and a phenomenon most clearly

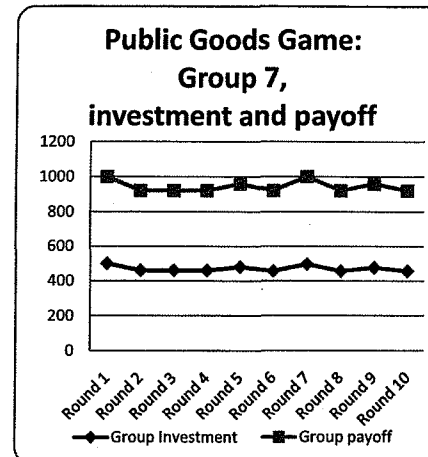


Fig 12: Group investment and payoff in group 7

Post-game interviews revealed a strategy of investing 100 MK every round. Even though the agreement was broken the game confirms Cárdenas and Ostrom's (2004) insights about near-perfect cooperation easily being achieved under these conditions. Figure 11 graphically displays how the group performed in terms of investment and payoff.

Next were two games with traders playing 10 rounds. The first of these had three women and two men. One of

visible in this out of all games played. I speak here of the commons-problem known as the free-rider problem (see chapter 3.2.2). In this case every player in 9 out of 10 rounds invested 100 MK with the exception of *one* player who consistently varied his investment from 60-100 MK. In round 8 one other player, a woman, withheld 20 MK as the only variation to this pattern. This man was able reap a great profit from the investments of others while always adding something extra to keep. In past games (like in group 5) we have seen that several sequential defections have been sanctioned through a drop in total

investment-levels. Again it is known from post-game interviews that the group had agreed on contributing 100 MK throughout the game. The agreement was almost entirely honoured by 4 of 5 players even though one decided not to care noteworthy of his obligation. In figure 12 this variation in group investment and return is displayed graphically. Keep in mind that almost all variation is created by a single player.

The final group consisting exclusively of traders also represents a special case at this point in the story. Again three trading-villages were represented. Here, however, there is little to say about the game. Every player in every round invested 100 MK. Thus this group somehow defeated the problem of free-riding. In post-game interviews players from this group would not admit having planned a strategy. Given the time they had to prepare and the fact that all players arrived more than an hour before the game I do not find this very plausible. As mentioned repeatedly Cárdenas and Ostrom (2004) show that this outcome of time after time, round after round, being able to collectively invest the maximum amount is not unusual when players can prepare strategies and no one breaks the agreement in the first rounds. Figure 13 displays this graphically.

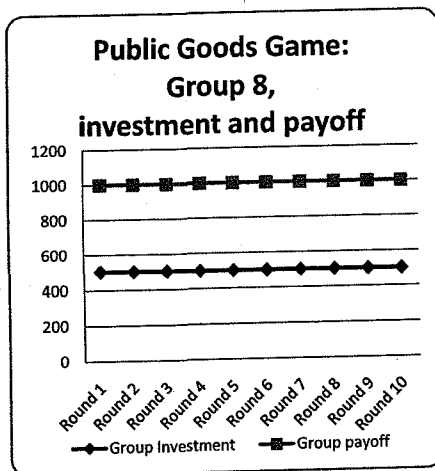


Fig 13: Group investment and payoff in group 8

5.8 The third series: true villagers play public goods games with traders

We have seen how *traders* and *true villagers* perform when playing on their own. In the following I explore what happened when these groups were mixed. The setup was identical to past games; four groups, two playing five rounds, two playing ten. Again, the first group is very interesting since the players cannot prepare a strategy in advance. They do not know before they come who they will play and they cannot know exactly what they are going to do.

Three players were *true villagers*, two were *traders*. There were three men and two women. One woman was a *true villager*, one a *trader*. Of the men two were *true villagers* while one

was a *trader*. This game turned out interesting in several ways. It differed greatly from past games, especially five-round games, in terms of investment-levels. In the first round we saw the lowest level of investment in any opening-round, totalling at 320 MK. One of the men from the *true village* invested nothing. The woman from the *true village* invested 40 MK, while the last *true villager* invested 100 MK. The *trader* man invested 80 MK while the woman invested 100 MK.

This woman kept her strategy throughout the game, altruistically investing 100 MK regardless of her fellow player's actions. From round one to round two the group's performance improved considerably. Only two people kept money. The man who previously kept 100 MK now invested 40 MK while the *true village*-woman invested 60 MK. The remaining players invested 100 MK. From this point collective investment-levels dropped sharply towards the last round. Group 9 is with Group 5 the only two groups where five players never simultaneously invested 100 MK. Two players acted altruistically throughout the game, one of them a *true village* man, the other a *trader*-woman. The *trader* keeping money systematically kept a smaller amount than the *true villagers* investing sub-maximally.

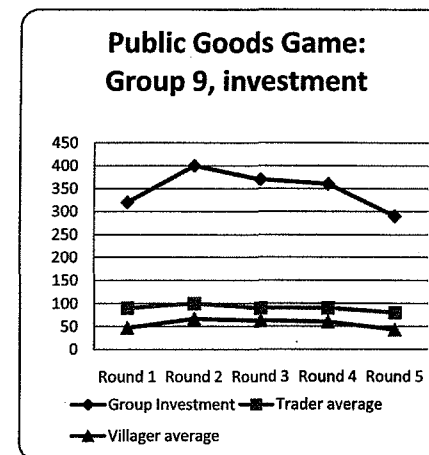


fig 14: Investment as group, average investment for traders and average investment for true villagers

Post-game interviews show distrust between players; especially *true villagers* expressed not trusting *traders*. Even though average investment for *true villagers* was 56 MK and average investment for *traders* was 90 MK, *true villagers* expressed keeping money in fear of *trader's* actions. As one of the respondents clearly said: "you can't trust traders!". Figure 14 graphically displays how much the group collectively invested at each stage of the game. In addition it displays average investment of *traders* and *true villagers* in every round. Average is used because of the uneven number of

players in the two groups.

Given the observations about this social boundary earlier, the result is not surprising. In this game the groups performed poorly when playing together. This, however, is not the case for the last three games. Explaining the results from these games I think may be just as much a methodological endeavour as it is a theoretical task. After the first game three more games were played. One with five rounds, two with ten rounds, as before. There were 25 rounds left to observe at group level; 125 individual decisions. Let me get to the point: out of these 125 decisions 124 were identical. In 124 out of 125 cases players invested 100 MK. This is, of course, something that renders many of my findings and assumptions about social boundaries and institutions in this area questionable. How could it be that this, something so important to the institutional reality of the world outside the games does not affect the games?

I have several ideas. First I cannot completely rule out the possibility of being wrong about the areas social and institutional makeup and the way that these boundaries affect people's behaviour in various situations. The two case-studies, however, indicate that the boundaries are indeed real. Another, more likely explanation, is that a genuine process of learning a good strategy for *harvesting* money has occurred. Investing 100 MK consistently you will earn 1000 MK at the end of a 5-round game and 2000 MK in a 10-round game provided the others do the same. Players in groups 9-12 had 8 games played before them, adding up to 40 players. This is a community of real social boundaries, but none the less it is a close-knit, small place. Believing that people playing towards the end of the summer had not discussed the games with previous players and also thought about possible strategies seems naïve.

This is mentioned as a problem in the literature. Inspired by laboratory science it is described as *contamination* (see Wagner 1958 or Schwartzman 1997). Once you play several games in one locality it is very hard to keep them from contaminating each other – knowledge about the first game spills over to the second and the effect is increased in the third. A public goods game is not isolated from the rest of the world and one cannot expect it to be hidden like some separate, parallel time-spatial event. While critics claim experimental games are far away from empirical reality (Swedberg 2001), once they are played it is hard to argue that they do not compose part of reality for participants and others hearing about them. Post-game interviews hint at this as a likely explanation. In two out of three games participants admitted having a strategy before the game. They were, however, uncertain if promises would be kept.

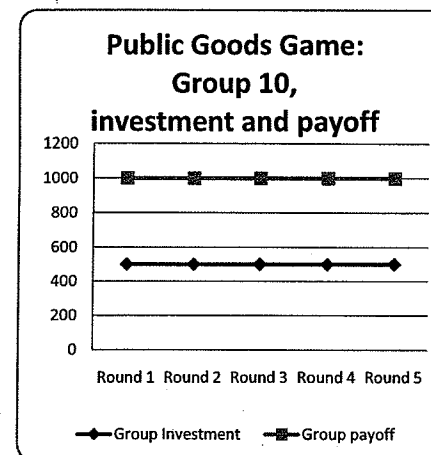


Fig 15: Group investment and payoff in group 10

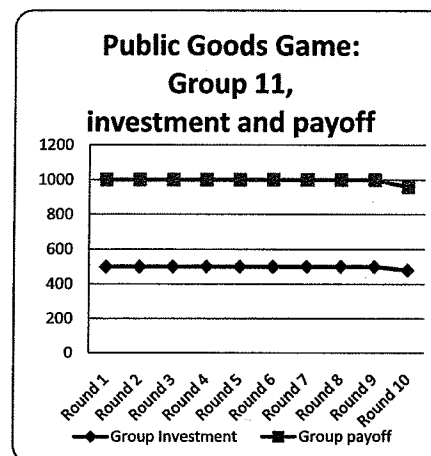


Fig 16: Group investment and payoff in group 11

task. I will assess this simply by looking at group-payoff. The gains people make from defecting is *individual* gain, while payoff in many ways measure group-performance. The *true villagers'* payoffs in the four games were: (1) 4960 MK, (2) 4240 MK, (3) 9960 MK, and (4) 8760 MK. This adds up to 27920 MK as a *true villager* result of all four games. When playing alone *traders* achieved: (1) 3740 MK, (2) 4900 MK, (3) 9440 MK, and (4) 10000 MK. This adds up to 28080 MK. Over 4 rounds traders perform *slightly* better than villagers. The

This uncertainty was most explicitly directed from *true villagers* towards *traders*. Several respondents explained using the first few rounds as test-rounds. Once it was established that all kept the agreement there was no reason to deviate. Figures 15-17 graphically display this

5.9 Concluding remarks: learning from public goods games?

In this chapter I have spent substantial amounts of space and energy on the results from a set of public goods games. At the end of this exercise I comment on the fruitfulness of such an endeavour. Further I elaborate on how the games has succeeded or failed in answering the questions formulated for them at the chapters beginning.

Let us begin with the latter task. The first question I asked was: *Will groups of people consisting exclusively of people from the same village achieve better results (as a group) than groups with people from mixed villages?*

Answering this is a relatively simple

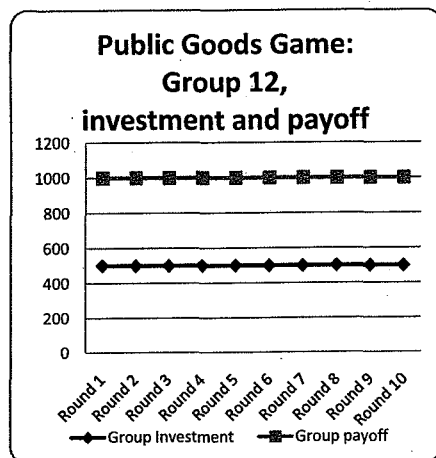


Fig 17: Group investment and payoff in group 12

does little to support the thought of social boundaries as barriers for cooperation and collective action.

The second question asked was: *Will groups with a strong presence of traditional leaders such as chiefs achieve better results as a group than groups with no presence of this kind?* Approaching this question requires a more qualitative mindset than the previous one.

Let us begin with a few observations in addition to some information which was revealed through post-game interviews. The chief of the *true village* played in the first game of the first series. This means he could not have planned ahead or instructed his fellow players. Still this game deviates from the first game of the other two series. In series 2 and 3 the first group always performs poorly, while in this round levels of investment were high. The chief's battle cry; "Let's harvest" or "we are here to harvest!" may have influenced the way other players acted. Respondents in many types of interviews indicated that this chief is a powerful and feared by many of his clients. Thus acting selfishly, keeping money in his presence may have been considered risky. This fits many observations made in regards to the borehole. Several respondents said the main reason for paying the monthly fee was fear of the chief's (and his family) reaction if they did not.

difference is, however, limited; after 150 individual choices by true villagers and 150 by traders the difference is a mere 160 MK.

In the last series of games traders and villagers were mixed. Their payoffs were: (1) 3480 MK, (2) 5000 MK, (3) 9960 MK, and (4) 10000 MK. This adds up to 28440 MK. Thus playing together gave the best end result. Group 9, the first group in this series is the *single game* with overall poorest performance, but all in all the results

The next way in which the chief may have influenced the games is of a different character all together⁹³. Once we started doing post-game interviews with respondents from the *true village* groups we began hearing rumours about a meeting held at the chief's residence. Some claimed all players from the village had been summoned and instructed by the chief to play the game a certain way. Other statements were not as clear, but it appears a meeting of some sort took place after the first day of playing. The result from the following series, however, does not show all players contributing the 100 MK in every round. Both game 2 and game 4 show distinct variations in pattern of investment. Thus if it is true the chief made an attempt at controlling the behaviour of other players many did not do as he said, perhaps in the lack of his presence. Regardless of that, the meeting is part of making the public goods game part of larger empirical reality for the villagers. Further it illustrates that collective action, even when there is time to plan ahead should not be taken for granted.

If we disregard the meeting there is one other game where one could suspect traditional institutions would be a particularly strong force due to presence of their representatives. This was game number 2, played with no less than two sisters of the chief⁹⁴. Where the first game saw an un-expected high level of investment, this game has several instances of free-riding. Overall the level of investment is relatively high, but in every round (except round 1) at least one player keeps a substantial amount of money and earns from other players investments. This was also done by one of the chief's sisters. In light of what we know about the management of money in the borehole organisation this may not come as a surprise. In terms of answering our question of whether or not groups with strong presence of traditional leaders performs better than others it does little to back this up.

At this point we have an answer to both questions. They are vague and provide little in terms of support for the past findings of this thesis. People from the same village did not perform better as groups than mixed groups. This may be a result of methodological flaws. It should, however, not be seen as a failure, but as an indicator of cooperation across social boundaries

⁹³ I would like to stress that it is not the chief as an *individual* that is of prime importance here. More significant is his role as representing and leading a specific kind of system or social organisation. With this follows a specific set of institutional "guidelines". Thus the chief (and perhaps others in his family) can be seen as the materialization, the physical presence of these institutions.

⁹⁴ The term *sister* can be interpreted in many ways in Malawi. In this case, however, it means the same as it most often means in Europe, a sister that is a woman sharing your father and mother.

as being possible given the right circumstances. For external agents wanting to initiate common pool resource regimes and other institutional setups this should be a positive signal.

The second answer is extremely vague. It does not appear that groups with strong presence of traditional leaders perform better than other groups. Again this may partly be ascribed to methodological issues, but at this point that is hard to determine.

What can we learned from the games? Most inspiring is it that cooperation is possible. Both case studies show what I have referred to as clashes of institutions and conflicts across social boundaries leading to severe problems of cooperation. The common pool resource-problems in one of the cases have been so troublesome that the system has collapsed (the irrigation system) and the other case shows clear symptoms of low sustainability (the borehole). With this as a backdrop it should be clear to external agents (as well as local forces) that making cooperation between the groups of people possible should be a goal. The public goods games do not give an answer to how one should solve social dilemmas and in particular common pool resource-dilemmas. What it does, however, is hint at it not being an impossible task. Especially series 2 and 3 gives hope. The first game in both series show poor results, (group 5 and group 9) while later games display massive improvement. Real world institutions are set up to govern regular repeated interactions, in my case studies in relation to two different common pool resources. The results of the games *may* indicate people being able to learn and adjust behaviour within the constraints of institutions, in this case the games, despite countervailing forces from other institutions. For institutional designers this is good news.

Further research, local knowledge, local institutions, power structures and external agents can all possibly be a part of solving (some of) the social dilemmas faced in the region. As we have seen, however, they can also constitute a problem, and finding the right "mixture" will not be an easy task. In the irrigation-system people continued working together despite the divisions and conflicts caused by social boundaries for as long as external funding was present. The fact that some respondents saw these games as "development games" might be an indicator that a similar effect was in play here. As long as possibilities for cash-transfers in exchange for certain actions are possible cooperation may not difficult.

6. CONCLUDING REMARKS

My point of departure for this thesis was the following research question: "*How can social institutions explain the different level of success in two common pool resource governance-regimes in the central region of Malawi?*". Let us now try to assess the material presented and hint at what the answer(s) to the question may be.

As is often the case in social science the answer will depend on how a question is phrased and, to use a worn out analogy, the theoretical spectacles utilised to interpret data. In this thesis I have argued that using the institutional framework is a suitable strategy for studying common pool resource-regimes. This is visible throughout the thesis and also shines through in the way I phrase my question of research. There are three main reasons for this. *First* the characteristics of common pool resources create a number of well-known problems (see e.g. Dolšák and Ostrom 2003). Many of these will materialise as *social dilemmas* for individual appropriators of common pool resources (See e.g. Kollock 1998 or Ostrom 2005). Solving these dilemmas may be an individual task, but we often see groups and organisations attempt solving them together. The cases studied in this thesis both display this feature. *Second* is the institutional framework itself. In studying situations of choice it allows insights to be drawn from different schools of thought. It does not assume models of either *Homo Sociologicus* or *Homo Economicus* (See Elster, 1989; 2007). In addition to lending itself to the study of individual choice it is suitable for macro-oriented views at organisational structures and the ways people operate together as groups. *Third* the knowledge of social institutions today is not restricted to scholars. The theory is utilised as a practical tool by NGO's and other agents of development who sees institutional design and "getting institutions *right*" as the best way of solving social dilemmas related to common pool resource governance (Nemarundwe and Kozanayi, 2003). That being said I by no means argue the institutional frameworks superiority in casting light on every aspect of the phenomenon studied. I do not want to be like the blind men of Buddha's famous parable, failing to see the whole of the elephant⁹⁵.

⁹⁵ "A number of disciples went to the Buddha and said, 'There are (...) many scholars who indulge in (...) dispute, some saying the world is infinite (...) others that it is finite (...). What, Sir, would you say concerning them?' The Buddha answered: 'Once (...) there was a Raja who called to his servant, '(...) go and gather (...) all blind men (...) and show them an elephant'. (...) He did. He said to the blind men 'here is an elephant' and presented to one its head, another an ear, another a tusk, the trunk, the foot (...) saying to each that was an elephant. (...) The Raja (...) said: '(...) what (...) is an elephant?' (...) The man with the head answered: 'the elephant is like a pot'. He who observed the ears replied 'It is like a basket'. Those knowing the tusk said a ploughshare (...). They then quarreled, shouting, 'Yes it is!' 'No, it is not!' (...) till they came to blows (...). The raja was delighted (...). 'Just so are these (...) scholars holding various views blind and unseeing (...) In ignorance they are by nature quarrelsome (...), each maintaining reality is thus and thus.' (Burlingame 1994, 75).

Many other approaches would have brought fruitful results; focus on social capital, trust, networks and network analysis, pure game theory or even assemblage theory are a few of the countless possibilities.

Let us again look at my question of research. "*How can social institutions help explain the different level of success for two common pool resource governance regimes in the central region of Malawi?*". To answer this we first need to establish that there is a difference in the level of success for the two common pool resource-regimes. When comparing the two cases of study the difference is obvious. One system has collapsed, the other has not; the latter is thus more successful than the first. That was the easy part. The tricky part is showing how social institutions can explain this difference in success. Let us begin in a simple way. We remember the basic assumption of institutions as being the "*rules of the game in society*" (North 1990, 3). The extractable resource from both the common pools I have studied is water. Thus I have been interested in water-institutions; the rules "*...of water development, allocation and utilization*" (Saleh and Dinar 2004, 11). It is important to remember, however, that not all institutions influencing behaviour related to these common pool resources are explicitly tied to water or the common pool resource. Societal norms, values and other codes of conduct are part of shaping human behaviour in general, and *also* behaviour displayed in situations related to common pool resources.

Simply put it is possible to explain the different levels of success by saying that the institutions around the borehole are more suited for solving (the specific) common pool resource-problem(s) tied to that particular system than the institutions governing the irrigation system is. This is an answer, however, without much substance. Let me therefore look shortly at some of the central similarities and differences between the two cases and try to make the simple answer bit more elaborate.

Ostrom (e.g. 1993; 2005) has identified a set of design principles that has been derived from studying long-enduring institutions for governing common pool resources. It is important to note that these are not specific rules that should blindly be adopted by local communities, but underlying principles of design; traits found *in* rules that must be shaped according to local circumstances. Both cases studied adopt solutions that violate the assumptions of these principles. The irrigation system does this to a larger extent than the borehole, and its collapse thus strengthens Ostrom's assumptions.

Both cases are characterized by a group of appropriators that in many ways are not homogenous. Social boundaries create different rules for people on different sides. This feature is stronger in the case of the irrigation system. People from many different villages work together and their status in terms of power and possibility to affect the outcome is clearly visible. The irrigation system has an explicit set of rules that is meant to regulate the members conduct, but local institutions deeply vested in the minds of people point in directions different from the rules designed by outsiders. In other words institutions in the *cultural-cognitive pillar of institutions* (Scott, 2001) are stronger and out-trump the new rules. In the meantime appropriators from different villages have different cultural-cognitive backgrounds. The literature is not clear on whether or not this type of diversity is positive or negative for the common pool resource-outcome, but the cases in this study suggests a negative effect of too diverse a group of appropriators. An objection to this point of view is that the rules designed by outsiders are simply the wrong rules. Had the rule makers considered the socio-institutional reality of this area to a larger extent they may have been able to craft rules working *with* the traditional institutions rather than working against them.

A third point is the role of external agents. The irrigation system has, compared to the borehole, been much more influenced by the actions of NGO's and the government. These agents have had their own explicit sets of rules for how the resource should be governed. The local community had to adopt these. The literature is numerous in warnings about how one goes about designing institutions (e.g. Goodin 1996; Dolšák and Ostrom 2003; Mandondo 1997; Namarundwe and Kozanayi 2003). As hinted at above it can be argued that when implementing their organisational and institutional frameworks the external agents did not have enough knowledge about the institutions *already in place* and how these would interact with the new systems. This seems very true for the irrigation scheme, and to a certain degree also for the borehole. If the external agent had known more about the social situation and institutions in the area they might for example foresee that their choice of location could cause future conflict. None the less they have to a much larger degree been left alone than in the irrigation system. In the public goods games cooperation can be interpreted as being achieved through external funding, stable rules of the game and a process of learning. Similarly cooperation in the irrigation-scheme seems to have been dependant on the external funds (in pure cash) to a much larger degree than the case was with the borehole. Once the cash was depleted cooperation ended abruptly. This may seem discouraging to outsiders

wanting to provide aid, but I must stress that also NGO's, governments and others should be receptive to local signals so that they may learn from past errors.

A fourth point worth considering is the complexity involved in the social systems. The irrigation system is a much more complex structure, both socially and physically than the borehole. This means there are challenges present in irrigation systems that cannot be found in the borehole-case. Irrigation creates social dilemmas that are not present in the same way at boreholes. The head ender/tail ender asymmetry (as described in Ostrom, 1993) is an example of this, the inclusion of *many* villages another.

Another issue that I have yet to raise is the boreholes status as a *primary source of drinking water*. People know that its breakdown will make obtaining clean water substantially more difficult. This makes the common pool resource of tremendous importance. Even though irrigation obviously provides benefits for farmers, it is secondary in terms of immediate human need, and a supplement which adds to security. Thus the threshold for free-riding and appropriation in other ways that could damage the resource may be lower. This point is, however, somewhat speculative and the status of different natural resources could use illumination through further research.

The points above add up and paint a picture of one common pool resource-regime that institutionally is significantly less well-equipped to endure than the other. Both common pool resources provide a resource that is vital to the survival and well-being of ordinary Malawians. It is not more than five years since the country experienced its latest famine. In this light it is sad that a system of irrigation with its possibilities of limiting the scope of- and avoiding future famines fall victim to events like described in this thesis. A series of unfortunate circumstances has occurred simultaneously, many of them of institutional character. On the other hand a borehole has survived many of the same challenges. Experimental data has provided grounds for optimism, and given the right institutional framework I am certain future projects of this kind could be successful.

This thesis has shown through two case-studies and a series of experimental games that cooperation can be achieved in this area. It has also shown, however, that achieving it is not an easy task. Through experiments we have seen that even under conditions that the literature claims to be ideal it should not be taken for granted.

As final concluding remarks let me say the following. In the study of common pool resources institutions *are* important. They affect the way people work together (or alone) to solve social dilemmas. Common pool resources take many shapes, but in common they hold importance to the lives and well-being of their appropriators. Thus studying and trying to understand types of resources and their interplay with institutions is an important endeavour for social scientists of varying disciplines, especially if one believes that the well-being and flourishing of people and their lives are important.

If Saleh and Dinar (2004) are correct in their assumptions about humankind approaching a global water-crisis, many common pool resources similar to those studied in this thesis will face similar and perhaps even more difficult problems in the years to come. In areas where water is an even scarcer recourse we can only speculate on possible outcomes. Will we see full-scale wars fuelled by different groups need and strive to control water sources? In light of this the understanding of how existing institutions affect the resource-outcome becomes extremely important. Further the importance of developing an understanding of how to- and how *not to* design institutions become increasingly important. If nothing else this thesis has underlined the importance and urgency of increased insight in the complex interplay between natural resources and social reality.

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Appendix 1.

Core questions/themes for semi-structured interviews about the two cases of study

- Establish respondent's identity and connection to the borehole/irrigation project. (Ask about name, which village respondent belongs to an whether or not the respondent use the particular borehole/irrigation-scheme in question)
- Could you tell us about the history of the borehole/irrigation project? (follow up on: dates, places, people/organisations involved. The respondent's personal involvement, and what the respondent thinks of the involvement of others. The involvement of chiefs)
- What can you tell us about how the borehole/irrigation project is governed? (follow up on: changes to this over time, how governing body is chosen – today and in the past, who is in governing bodies, what powers governing body possesses, who oversees governing bodies, who do they report to? What does respondent think of the job the governing bodies do? Does respondent trust the governing bodies?)
- How is the boreholes/irrigation project daily operation financed? (follow up on: who controls the money, who collects fees, what punishments are there for not paying fees, where money is kept, if there are written records, if respondent trusts those handling money, if there are special rules for how money should be handled, if money has ever been embezzled)
- What can you tell us about maintenance on the physical structures of the irrigation project/the borehole (follow up on: who participates, who pays, who does not participate, different "types of people" participating, the punishments – formal or informal for not participating, the role of external agents)
- Who are the people using the borehole/the irrigation project (follow up on: how many are they, from different villages, differences in wealth, power, status, different "types" of people)
- Do you know any rules tied to the borehole/irrigation project? (follow up on: violations of the rules, sanctions– what are they and who has the power to apply them, difference in rules/sanctions for different people, special rules for people in governing bodies, written or oral rules, if level of rules/punishment today is proper, If there is a need for more rules, if some "types of people" violate the rules more frequently than others, if there are unwritten rules/assumptions about behaviour related to the borehole/irrigation project, monitoring – who does it and how? How many do you

know that has been punished, how many violations do you know of that has not been punished, have you been punished?)

- Do users of the borehole/irrigation project trust the other users of the same borehole/irrigation system? (follow up on: level of trust in these project compared to other projects in the area, instances where trust has been breached, if users of the same borehole/irrigation project socialise outside the context of the systems, if they lend other participants money, food or other valuables, if trust has increased/decreased since the beginning)
- Throughout the interview; follow up on points of special interest. Scrutinise vigorously if respondent gives information on topics not discussed in past interviews.

Appendix 2.

The public good game as it was explained to the participants. English and Chichewa version.

The public good game 200706	Sewero la chuma cha mudzi Trading Centre
Dear all of you, We are very pleased to see so many here today. We have asked you to come here to play a game. By playing the game we propose you may earn some money. The rules are simple but the results may be variable, some may earn a substantial amount some very little. But no player will go home with nothing. Since there are so many here we should state very clearly at the outset that there are just 20 people that will be selected to play. You may stay to listen to the explanation for the game. Once we are through with that those who do not think it worthwhile to play will be asked to leave. Then we will select 20 by drawing lots. These 20 will be divided into 4 groups with 5 players in each. Then each group will get to play. Group 1 today, groups 2 and 3 tomorrow and then group 4 the day after that. When the game starts players are given 100 kwacha. Then each participant is supposed to decide on investing the money or not. If you do not invest the money you keep the 100	Zikomo amai ndi abambo, Tiri okondwa kuona m'mene mwabwerera mwaunyingi chonchi. Takuitanani kuti mudzapange sewero. Nkusewera masewero amenewa mulandira ndalama ndipo pakutha kwa masewerowa ndalamazo zikhala zanu. Malamulo a masewerowa ndiyapafupi koma zotsatira zake zikhoza kukhala zosiyana-siyana. Ena akhonza kupata ndalama zambiri, koma ena mwina pango'ono. Koma palibe aliynse amene angachoke opanda kanthu. Popeza kuti mwachuluka, tineneretu pano kuti amene asankhidwe kuti asewere nawo masewero amenewa ndi anthu 20 okha. Muli oloedwa kumvera zakaseweredwe ka masewerawa. Ngati muganiza kuti simufuna kusera nawo, tidzakupemphani kuti mupite. Awo aganiza kuti asewera nawo akhale. Ndipo mwa amenewa tidzasankhapo anthu 20 mwa maula. Anthu 20 osankhidwawa tidzawagawa m'magulu anai ya anhtu asanu pagulu. Gulu liri lonse lidzatha kusewera seweroli. Gulu loyamba lisewera lero, lachiwiri ndi lachitatu mawa ndipo lachinai mkuja.

kwacha. If you want to invest it you can invest 20, 40, 60, 80, or 100 kwacha.

Depending on how much each one invests, you may at the end of the game put in your pocket as much as 260 kwacha every time we play or it may be as little as 40. We will play the game 5 times today. Thus in the worst case, the least you will earn is 200 kwacha and in the best of circumstances you may take away 1300 kwacha. But doing that is not easy.

In each play there will always be 5 players and the rules of the play are simple. But they are made so that what you earn depends as much on what your fellow players do as on what you do yourself.

The game is like five persons being offered to do some work together in one day. If the work is completed during the day each will get 200 kwacha. Each one might find work that provides 100 kwacha this day. But sometimes joint work is necessary and if all work hard and complete the work they have started the pay will be 200 kwacha to each this day. However if someone goes away to do extra work for himself, hoping that the others will be able to complete the work, the work will not be completed and the pay to each will be less than 200. Sometimes it will be less than the 100 kwacha one might have earned working alone.

In the game here we are not doing work. We call it investment. The investments you make or do not make go into a common chest and there the money breeds so that the amount coming out is twice as large as the one you put in. This is the same as five working together can earn more than each one working alone. If all five players put in 20 of the 100 kwacha you will be given, there will be 5 times 20 kwacha, or one hundred kwacha. After breeding these become 200 kwacha and this is then divided equally between the players so that each gets back 40 kwacha. You put in 20 kwacha and get 40 back. You still have 80 so that after such a

Masewera akayamba, aliynse pa gulu adzapatsidwa K100. Tsono aliynse adzayembekezeka kusungako ndalamazi mkathumba ngati ku banki. Ngati simufuna kutero mukhoza kusungitsa. Koma ngati mufuna kusungitsa mukhoza kusungitsa K20, K40, K60, K80 kapena K100. Malingana ndim'mene aliynse wasungitsira, ndikotheka kuti pakutha paseweroli aliynse akhoza kuchoka ali ndi ndalama zokwana K260 nthawi iriynse mwasewera masewerowa. Komanso nkutheka kuchoka nditindalama tochepe ngati K40. Gulu liri lonse lidzasewera masewera amenewa kasanu. Motero kuti zitati zabvutitsitsa ka K200 konse munthu atapata. Koma zitayenda bwino, munthu akhonza kuchoka pano ndi K1300. Koma zimenezo sizapafupi ai.

Nthawi iriynse masewerawa adzakhala a gulu la anthu asanu ndipo malamulo ake ndi apafupi. Koma maserawa akonzedwa motero kuti ndalama zimene mungapate zidzalingana ndi m'mene anzanu kapena inuyo mukusungitsira.

Masewera amenewa afanana ndi kuti anthu asanu agwire ntchito pamodzi ya tsiku limodzi. Ngati amaliza ntchitoyi, aliynse alandira K200. Koma aliynse payekha akhoza kupeza ntchito ya malipiro yokwana K100 patsiku. Koma nthawi zina ntchito yamgwirizano imafunika ndipo aliynse akamalimbikira ndi kumaliza ntchitoyo, aliynse alandira K200. Koma ngati wina akagwira ntchito kwina alikuganiza kuti anzakewo amaliza ntchitoyo, ntchitoyo siingathe ndipo aliynse akhoza kulandila ndalama zochepera K200. Mwinanso ukagwira ntchito pawekha ukhonza kulandila ndalama zochepera K100.

Koma pano tichita masewera osati kugwira ntchito. Masewerowo tikuwacha kusungitsa ndalama ndicholinga chopanga phindu. Mukasungitsa, kaya simudasungitse koma azanu asungitsa, ndalamazo zikalowa mu thumba la nonsenu ndipo ndalamazo

game you will have 120 rather than 100. Now we come to the part that may cause you some problems. There is no rule about how much each one of you should put into the common chest. Each one has to decide for herself or himself: Should it be nothing, 20, 40, 60, 80, or 100 kwacha? The problem lies in what you believe the other players do. If you put in 100 kwacha and the other 4 put in nothing there will be 100 kwacha in the chest. These breed to become 200 and each one of you get 40 kwacha returned. You who put in 100 kwacha have 40 and those who put in nothing have 140. On the other hand if you put in nothing and all the other 4 put in 100 each there will be 400 in the chest. These breed to become 800 kwacha and are divided equally among you so that each gets 160. Those who invested 100 will now have 160 while you who invested nothing will have 260. If some invest say 40 or 60 or 80 kwacha the sum in the chest will be less but it still breeds to become twice as large and is still divided equally among you. The amounts will be in between those we have mentioned. If all invest everything you will all double your capital. If you do not invest while the others invest you will earn more income than the others. If no one invests anything then each one of you has the 100 kwacha you were given. If you invest for example 20 kwacha while nobody else invests there is only 20 kwacha that breeds to become 40 kwacha. Divided equally on the five players each gets 8 kwacha. You who invested 20 kwacha will now have 88 kwacha and those who invested nothing have 108. Do you understand the rules of the game? We have explained the rules as well as we are able to. If you have questions, if there are some parts of our explanation that you do not understand, please help us by asking a question.	zikachulukitsidwa kotero kuti Kwacha iriyonse ikabala inzake. Izi ndichimodzimodzi ngati anthu asanu kugwira ntchito pamodzi kuti alandire ndalama zochuluka kupambana kugwira aliyense payekha. Ngati aliyense atasungitsa K20 pa K100 imene mwapatsidwa, ndiye kuti mwasungitsa K100. Ndipo K100 imeneyi itachulukitsidwa ikwana K200 ndipo idzagawidwa mofanana kotero kuti aliyense adzalandira K40. Munasungitsa K20 koma mwapanga K40. Kuphatikiza ndi K80 imene mudatsala nawo ija ndiye kuti tsopano muli ndi K120. Tsopano tibwera pambali imene ingakubvuteni inu. Palibe lamulo lokuuzani kuchuluka kwa ndalama zimene mungasungitse. Aliyense adziwa yekha ndalama zimene afuna kusungitsa. Kaya ndi K20, K40, K60, K80 kapena K100, izo ziri kwainu. Pamene pali bvuto ndipoti munthu udziwe kuti kodi anzako asungitsa ndalama zingati. Ngati inu musungitsa K100 koma anzanu asungitsa zero, ndiye kuti mu thumba lanu mukhala K100. Ikachulukitsidwa ikwana K200 ndipo aliyense alandira K40. Inu amene mudasungitsa K100 mukhala ndi K40 koma amene sadasungitse aja akhala ndi K140. Komanso, ngati inu mutapanda kusungitsa koma anzanu ndi kusungitsa aliyense K100 ndiye kuti muthumba mukhala K400. Imeneyi pochulukitsa ikwana K800 ndipo pamapeto pake aliyense amene adasungitsa akhala ndi K160 pamene amene sadasungitse akhala ndi K260. Koma ngati ena asungitsa K40 kapena K60 kapena K80, ndalama mthumba zikhalamo zochepa koma zichulukitsidwabe ndikugawidwa mofanana kwa aliyense. Ndalama zokhala ndi inu zikhala pakati pa K40 ndi K260. Ngati inu nonse mutasungitsa K100 aliyense ndiye kuti ndalama zanu zidzabelekana kawiri. Koma ngati nonse simusungitsa kanthu, ndiye kuti aliyense adzakhala ndi K100 imene adapatsidwa.
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There are today ____ people here. We said at the start that we would select 20 to play the game. We also said that there will be 5 players in a game. Thus we will play a total of 4 games. We want to select these 20 today. We want to do this by drawing lots as in a lottery. We have explained how the game is played and those who think such games inappropriate should feel free to go home. When we get to the stage where we play the game only the players will be allowed to stay.	Mwachitsanzo ngati inu mutasungitsa K20 ndipo anzanu onse osasungitsa kalikonse, ndiye kuti K20 ibalana kukwana K40 ndipo aliyense alandira K8. Chooncho inuyo amene munasungitsa pamapeto pake mukhala ndi K88 koma anzanu amene sadasungitse akhala ndi K108. Kodi mwamvetsetsa? Ngati pali mafuniso, kapena pena pake simudamvetse kulibwino kufunsa kuti tifotokozenso. Pali anthu ____ pano. Poyamba paja tinanena kuti tisakhapo anthu 20 okha oti asewere masewerowa. Tinanenanso kuti tikuikani m'mgulu ya anthu asanu. Tsopano tifuna tisankhe anthu 20. Izi tipanga mwa maula. Tafotokoza m'mene masewera achitikire ndipo ngati alipo amene sakufuna kusewera nawo ndiwomasuka kupita kunyumba panopa. Tikatha kusakha anthu oti asewere, ndiwokhawo amene adzaloredwa kukhala pano. Ena nonse mudzafunsidwa kuti muchoke.
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Appendix 3.

Core questions for short semi-structured interviews concerning the public good games.

- Who in the game did you trust most prior to the game?
- Who did you trust the least?
- Did your group agree on a strategy prior to the game?
- Before the game; how much did you believe the others would invest, and why?
- Did you have any friends/relatives/family in the game?
- If so; did you discuss with these prior to the game?
- Did the other players in the group know each other well?
- If you had a chance to play the same game over again; what would you do?
- For players of late games; had you heard about the games played earlier – what had you heard?
- Throughout the interview; probe with specific game/game results in mind

Appendix 4

Pre-game and post-game questionnaires filled out by participants of public goods games.

Filled out by participants under assistance of interpreters fluent in Chichewa

QUESTIONS TO BE ASKED BEFORE THE GAME

A1. Date (record)

A2. Player no (record)

Day	Month	Year

Player number

D1 Is [player] male or female? (record)

Male ☐ 1
Female ☐ 2

D2 How old were you at your last birthday?

Completed years

D3 How long have you been going to school?

Did not complete primary
Completed primary
Secondary junior certificate
Completed secondary school
Do not know

☐
☐
☐
☐
☐

D4 How much land does your household own?

Do not own land

☐

Approximate amount owned

D5 And how much does it rent?

Do not rent land

☐

Approximate amount rented

N6 Do you think your household has more or less land and other valuable resources than what is typical for the households in your village?

Much less ☐ Less ☐ About the same ☐ More ☐ Much more ☐

QUESTIONS TO BE ASKED AFTER THE GAME player no _____

M1 Generally speaking, do you think most people can be trusted or that they cannot be trusted?

Most people can be trusted ☐ 1
Most people cannot be trusted ☐ 2

WM1 Do you in general trust leaders and officials? Do you trust all, most, some or just a few people in the following groups?

	All	Most	Some	Only a few	Do not know
Government officials	☐	☐	☐	☐	☐
Councillors	☐	☐	☐	☐	☐
Local assembly staff	☐	☐	☐	☐	☐
Traditional authorities	☐	☐	☐	☐	☐
Group village headmen	☐	☐	☐	☐	☐
Village headmen	☐	☐	☐	☐	☐
Courts	☐	☐	☐	☐	☐
Army	☐	☐	☐	☐	☐
Leaders of NGOs	☐	☐	☐	☐	☐
Police	☐	☐	☐	☐	☐
Traders	☐	☐	☐	☐	☐
Teachers	☐	☐	☐	☐	☐
School administrators	☐	☐	☐	☐	☐
Religious leaders	☐	☐	☐	☐	☐

WM2 Do you in general trust people in this area? Do you trust all, most, some or just a few people in the following groups?

	All	Most	Some	Only a few	Do not know
Your family members	☐	☐	☐	☐	☐
Your relatives	☐	☐	☐	☐	☐
Your village	☐	☐	☐	☐	☐
People from outside the village	☐	☐	☐	☐	☐
People of same ethnic group	☐	☐	☐	☐	☐
People from outside ethnic group	☐	☐	☐	☐	☐
People from same church/mosque	☐	☐	☐	☐	☐
People not from same church/mosque	☐	☐	☐	☐	☐

D4 How long would it take you to earn 100 kwacha?

Do not know
Approximate number of hours

D5 And how long would it take you to earn 1000 kwacha?

Do not know
Approximate number of hours

D6 What were you speculating about when you decided how much to put in the common chest?
< write on the other side of this sheet >